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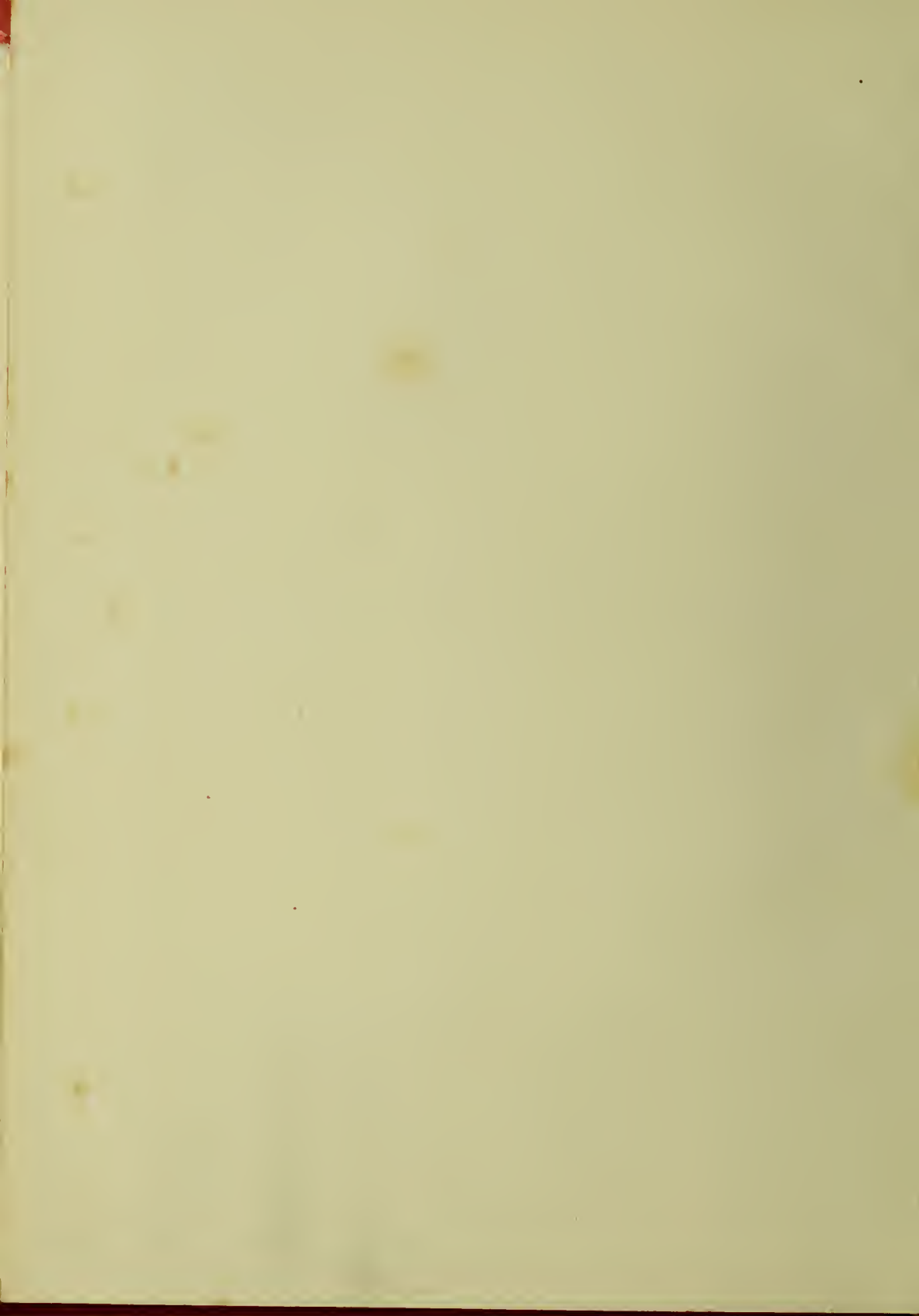


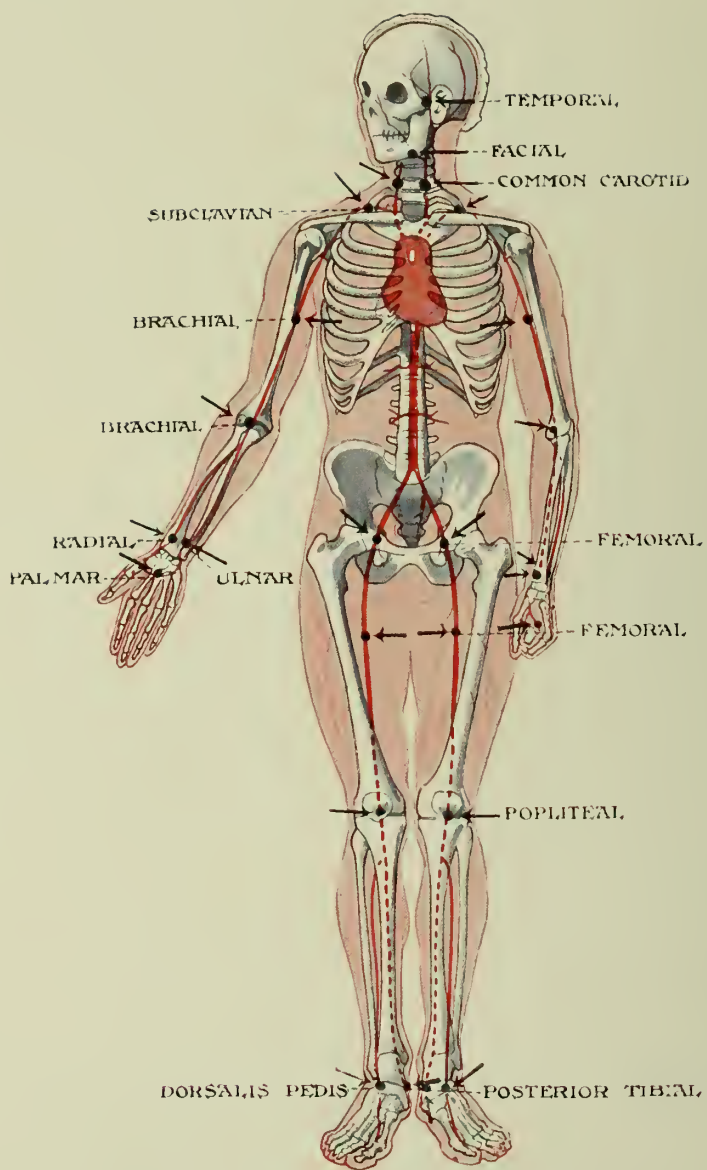
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THE SCIENCE AND ART OF NURSING





PRESSURE POINTS OF THE MAIN ARTERIES.

THE SCIENCE AND ART OF NURSING

A GUIDE TO THE VARIOUS BRANCHES OF
NURSING, THEORETICAL AND PRACTICAL

BY
MEDICAL AND NURSING AUTHORITIES

*ILLUSTRATED WITH COLOURED AND BLACK-AND-
WHITE PLATES AND FIGURES IN THE TEXT*

IN FOUR VOLUMES

VOL. III

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SCIENCE AND ART OF NURSING

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CHAPTER XXII

SURGICAL AND ACCIDENT NURSING

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I.—HÆMORRHAGE

HÆMORRHAGE may occur from the arteries, veins or capillaries, and either appear externally—external hæmorrhage—or be retained inside one of the body cavities—concealed hæmorrhage. In external hæmorrhage the diagnosis is obvious, for besides exhibiting the general symptoms of loss of blood, the blood will be seen, and the amount can be estimated, but in concealed hæmorrhage the diagnosis is often difficult until the patient has lost so much blood as to be in danger of dying.

Hæmorrhage may also be primary, intermediary, or secondary.

Primary hæmorrhage occurs directly after a wound is made, and is the variety of hæmorrhage most commonly seen.

Intermediary hæmorrhage occurs within twenty-four hours of the primary wound, and is due to re-opening of a cut vessel. This may

be brought about by the slipping of a ligature, or by increased force of the heart-beat displacing the clot of blood with which Nature temporarily closes cut vessels. It is for this reason that stimulants, which increase the force of the heart-beat, are contra-indicated in hæmorrhage unless the bleeding vessel has been securely tied.

Secondary hæmorrhage is caused by suppuration extending into the walls of the vessels, or by the vessels becoming gangrenous. It is not uncommon during the separation of the sloughs of bad burns (p. 45), and it is sometimes seen after operations in which asepsis has failed. Ulceration occurring in new growths will sometimes open a large vessel and cause secondary hæmorrhage, and is one of the ways by which life is terminated in malignant disease.

CONCEALED HÆMORRHAGE

The general signs and symptoms by which loss of blood is diagnosed are these : The patient becomes increasingly pale, the red mucous membranes become pink, the pulse is quickened, the respiration sighing, and the temperature falls. The patient is restless and sweating, the pupils are dilated, and there are attacks of syncope. If the hæmorrhage is not checked the symptoms end in death.

Concealed hæmorrhage not unfrequently occurs after operations on the chest or abdomen, or it may be the result of accident, and the nurse must learn to recognise its onset by the above symptoms.

Treatment of concealed hæmorrhage.—The patient should be placed lying down with the head low, and the foot of the bed well raised. The limbs should be bandaged from the extremities towards the trunk, and a binder placed on the abdomen. The object of this treatment is to drive the blood from the limbs and abdomen into the thorax and head so that the heart and brain may be well supplied with blood. Stimulants must on no account be given, for the feeble beat of the heart in syncope is an advantage, since it checks the bleeding.

As the only sure way of arresting hæmorrhage is to secure the bleeding vessel, the surgeon should be at once informed if the nurse has reason to suspect concealed hæmorrhage.

EXTERNAL HÆMORRHAGE

The diagnosis of external hæmorrhage is obvious, for besides the general symptoms of loss of blood the blood itself will be seen, and the

amount lost may be estimated, but it is important to be able to diagnose which variety of hæmorrhage is present, as the treatment varies according to the vessel from which the blood comes. External hæmorrhage may be (1) primary arterial, (2) primary venous, (3) primary capillary, (4) intermediary, (5) secondary.

I.—PRIMARY ARTERIAL HÆMORRHAGE

This occurs directly the vessel is severed. The blood is bright red in colour, and escapes from the wound in a series of jerks, corresponding to the beats of the pulse. The bright red colour is that of blood containing plenty of oxygen.

First-aid treatment.—The part from which the bleeding is occurring should be elevated, and direct pressure made in the exposed wound with the thumb of one hand, in such a way that the thumb presses on the spurting vessel.

If a clean handkerchief or piece of linen be available this may be stuffed into the wound and pressed down with the thumb.

Although hæmorrhage must be arrested at all costs, yet the rules of asepsis should not be neglected, and as far as possible interference with the wound with dirty fingers and rags should be avoided.

Pressure with the thumb in the wound will usually be sufficient to control the hæmorrhage, but if the bleeding continues the main artery supplying the part must be pressed against the nearest bone with the thumb of the other hand. All the main arteries of the body have special places where pressure is most effective, and these points must be learnt by the nurse (pp. 5, 6).

Unless bleeding is taking place from the very large vessels, such as the common carotid, it can always be arrested by these means, and it is seldom that a patient dies of primary hæmorrhage if skilled help is at hand.

Pressure with the thumb on the artery can only be maintained for about ten minutes, and during that time a tourniquet can be obtained or improvised.

Tourniquets.—A tourniquet consists essentially of a band which goes round the limb, and which can be tightened sufficiently to arrest the circulation in all the vessels of the limb. The best varieties have a firm pad which is placed over the main vessel of the limb so that the pressure chiefly falls on it, and hæmorrhage is arrested without the other structures, such as the nerves, suffering from the pressure.

Esmarch's tourniquet.—This instrument or one of its modifications is the tourniquet that is most frequently used, as there is no necessity for the person applying it to have any technical knowledge. It is simply a plain indiarubber band, which is wound tightly round the limb two or three times, and the ends fastened by hooks or tapes. The only possible mistake to make in applying it is, that it may not be applied tightly

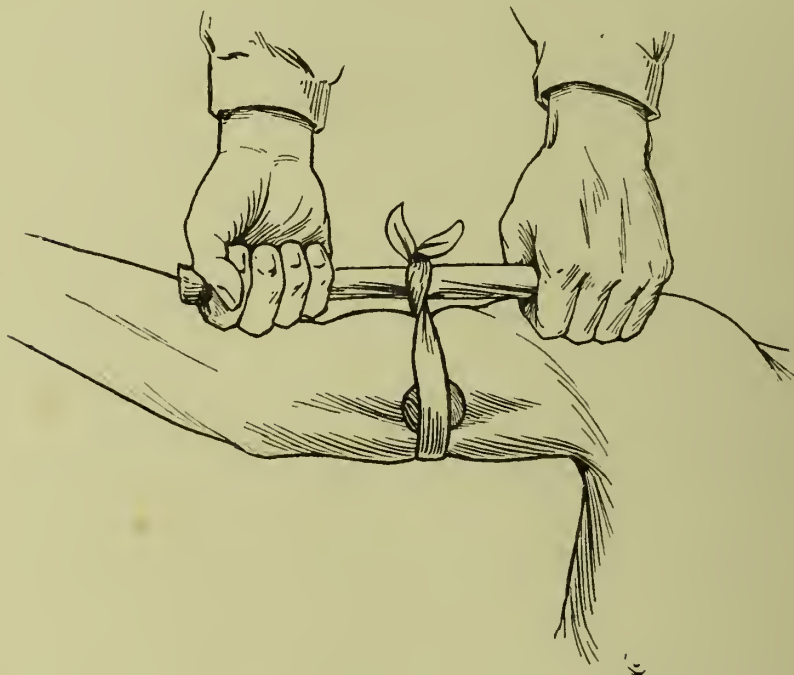


Fig. 70.—IMPROVISED TOURNIQUET APPLIED TO BRACHIAL ARTERY.

enough. In this case the thin-walled veins are compressed whilst the thicker walled arteries escape, and the bleeding is increased instead of being arrested. The more turns taken round the limb the more likely is the pressure to be effectual.

In some elastic tourniquets a box-wood pad with a slot is introduced into the circuit. The box-wood pad is placed over the main artery so that it is compressed against the bone, the band is then carried round the limb and fastened in the slot. This is a useful modification because the artery is directly pressed upon, but it is necessary to know the



COMMON CAROTID.



FACIAL.

PLATE XXXVII.—DIGITAL COMPRESSION OF THE COMMON CAROTID
AND FACIAL ARTERIES.

exact place upon which to place the pad, otherwise it is worse than useless. It can only be used by someone possessing anatomical knowledge.

An improvised tourniquet.—For emergencies a tourniquet can be made from a stout handkerchief or a scarf. If the nurse knows where to place the pad one can be improvised from a piece of wood, a stone, a roller bandage, or a knot in the scarf.

The handkerchief or scarf should then be tied firmly round the limb and over the pad above the bleeding point. A piece of stick is slipped under the handkerchief, and by twisting this round, enough pressure to occlude the artery can readily be obtained. If the nurse is not sure where to place the pad it should be omitted, but the tourniquet will then have to be more tightly applied.

As soon as other means of checking hæmorrhage are forthcoming the tourniquet should be removed, as it is exceedingly painful, and in no case should it be left on for more than two hours, otherwise gangrene of the limb may follow.

Should the nurse have at hand a pair of Spencer Wells forceps she should fasten them on to the bleeding point if she can see it. Stimulants should never be given in cases of hæmorrhage until the bleeding vessel has been secured and tied, and only then when ordered by the surgeon.

The main arteries and their pressure points (*see Frontispiece*).—
(1) *Common carotid*.—This artery supplies the greater part of the head and neck, and should be compressed against the transverse process of the sixth cervical vertebra. This tubercle lies about two inches above the clavicle at the anterior border of the sterno-mastoid muscle. Pressure should be made backwards and a little inwards. (Plate xxxvii.)

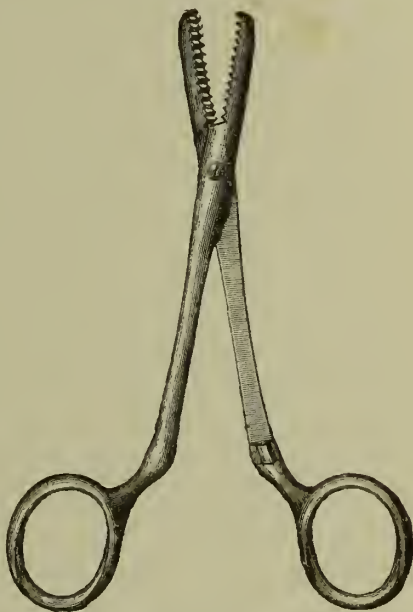


Fig. 71.—SPENCER WELLS ARTERY FORCEPS.

(2) *Facial*.—This artery supplies the face, and is easily compressed as it crosses the lower border of the jaw at the anterior border of the masseter muscle. Hæmorrhage from the scalp can be stopped by pressing the bleeding artery against the skull bones. (Plate XXXVII.)

(3) *Brachial*.—For all bleeding below the middle of the arm the brachial artery, which is found on the inner side of the arm, should be compressed backwards, and a little outwards against the humerus. (Plate XXXVIII.)

(4) *Subclavian*.—This artery lies above the clavicle, and pressure on it will control hæmorrhage above the middle of the arm and in the axilla. Firm pressure with the thumb should be made from above downwards and a little backwards behind the middle of the clavicle, pressing the artery against the first rib. (Plate XXXVIII.)

(5) *Common femoral*.—To find this vessel take the mid point between the symphysis pubis and the anterior superior spine of the ilium, and then press the artery firmly downwards against the pubic bone. (Plate XXXIX.)

The femoral artery runs down the inner side of the thigh, and in hæmorrhage below the knee the vessel can be compressed in the middle of the thigh against the femur, pressure being made backwards and outwards.

(6) *Dorsalis pedis*.—This artery is controlled in case of bleeding from the dorsum of the foot. It lies midway between the two malleoli. (Plate XXXIX.)

(7) *Posterior tibial*.—To arrest bleeding in the sole of the foot the posterior tibial artery should be compressed as it passes midway between the heel and the internal malleolus. (Plate XXXIX.)

2.—PRIMARY VENOUS HÆMORRHAGE

When a vein is cut across, the blood runs out slowly without spurts. The blood is dark in colour, being de-oxygenated.

Venous hæmorrhage is, as a rule, readily checked by the formation of a clot in the vessel. The rapid formation of the clot is favoured by the slow blood-stream and the collapse of the walls of the vein.

Venous hæmorrhage is therefore of little danger unless it be from one of the main veins of the body or from varicose veins.

Varicose veins are large tortuous veins which are commonly present in the lower extremity from various causes. They are frequently

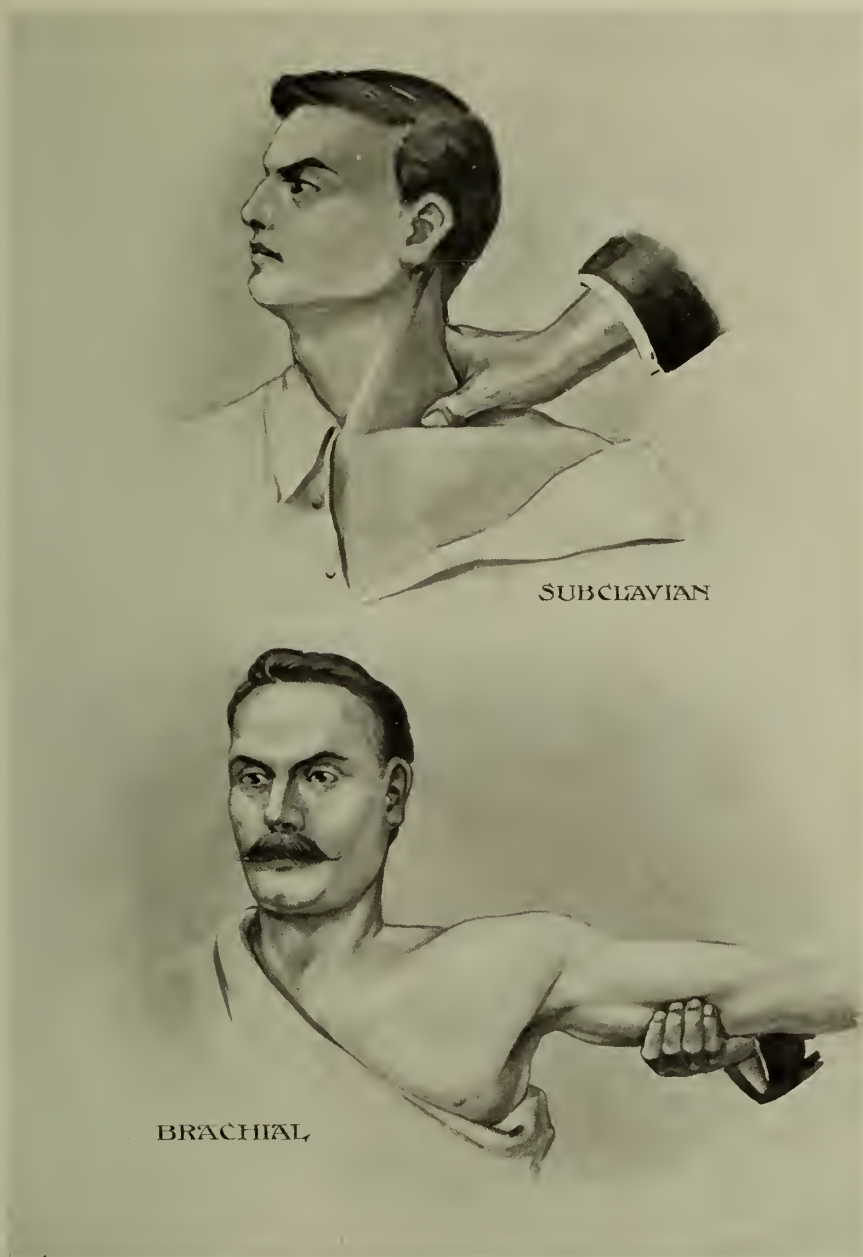


PLATE XXXVIII.—DIGITAL COMPRESSION OF THE SUBCLAVIAN AND BRACHIAL ARTERIES.



complicated by ulcers which may open into the veins, or a vein may burst as the skin over it becomes atrophied and thin.

Should a varicose vein open, the bleeding is very profuse, as the veins are large, and the walls, being diseased, do not collapse like those of normal veins.

First-aid treatment.—(1) Elevate the bleeding part. If the hæmorrhage be from the lower extremity lie the patient flat on his back and raise the limb.

(2) Expose the wound, see that there is nothing constricting the limb above the wound, *i.e.* nearer the heart.

(3) Press with the thumb or a *clean* handkerchief on the bleeding spot.

No stimulants should be given, and a tourniquet should never be used. A clean pad properly applied and secured by a bandage will always arrest venous hæmorrhage sufficiently to allow the patient to be moved.

To avoid congestion below the wound the bandage should be carried from the extremity up to it.

3.—PRIMARY CAPILLARY HÆMORRHAGE

Between the termination of the arteries and the commencement of the veins is the network of very small vessels called capillaries.

Serious hæmorrhage will sometimes occur from these small vessels after an abscess cavity is scraped, or adenoids have been removed, or a tooth extracted.

Capillary hæmorrhage of a grave nature is also seen in cases of severe jaundice and hæmophilia. The latter disease is a curious family complaint, and the male members of such families are liable to serious capillary hæmorrhage from slight cuts and abrasions, the hæmorrhage sometimes lasting for days and even proving fatal. The females are sometimes affected, and the first menstruation may prove fatal.

First-aid treatment.—If capillary hæmorrhage is taking place into a cavity such as an abscess cavity it is readily arrested by packing the cavity with aseptic gauze.

On a raw surface it can be arrested by one of the following methods :—

(1) Bathing the wound with water at a temperature of 115° F. This is water as hot as it can be borne. Hotter water than this will cause scalding, and cooler will increase the blood flow.

(2) Application of cold water or—better—iced water so as to contract the vessels of the part.

(3) Sprinkling the wound thickly with an antiseptic powder such as boric acid or iodoform. This will favour the formation of a clot.

(4) Applying certain drugs called styptics or hæmostatics. Of these the most easy to obtain is turpentine; whilst in hospital, tincture of iron and adrenalin are those most commonly used.

Cobwebs, an old-fashioned form of remedy, should never be used as the dust present in them may contain the bacillus of tetanus.

4.—INTERMEDIARY HÆMORRHAGE

This form of hæmorrhage may occur from either arteries or veins; it is merely a repetition of primary hæmorrhage, and needs the same treatment. As it nearly always occurs after operations it is one of the things a nurse should carefully watch for and at once report to the surgeon in charge of the case. Whilst waiting for assistance she should firmly press on the wound, and if the bleeding be arterial the main artery above the wound should also be compressed. If the nurse has assistance preparation should be made for giving an anæsthetic and opening up the wound, so that if the surgeon on his arrival decides to operate there may be no delay.

Intermediary hæmorrhage is very frequently concealed (p. 2), and this adds to its danger by the difficulty of diagnosis.

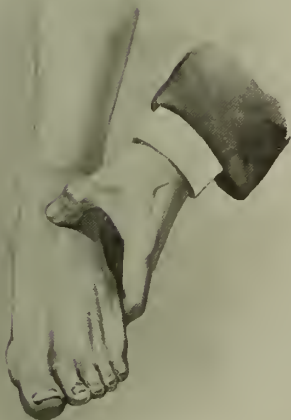
5.—SECONDARY HÆMORRHAGE

In cases of suppuration occurring near large vessels secondary hæmorrhage is always to be anticipated, and when it is feared an elastic tourniquet should be placed near the patient. It should be in an exposed position, where it can be instantly seen and applied by anyone if secondary hæmorrhage occur. The rush of blood is sometimes quite sudden, and it may be a matter of moments only before enough blood is lost to endanger the patient's life.

First-aid treatment.—This is precisely similar to that of primary hæmorrhage. The rapid application of a tourniquet is usually all that is necessary. The surgeon should at once be informed, and no stimulants must be given.



COMMON FEMORAL



DORSALIS PEDIS



POSTERIOR
TIBIAL

PLATE XXXIX.—DIGITAL COMPRESSION OF THE COMMON FEMORAL
DORSALIS PEDIS AND POSTERIOR TIBIAL ARTERIES.

EPISTAXIS

Bleeding from the nose may be spontaneous or may follow an injury, and the amount of blood lost may be very great.

In the early stages of the bleeding the patient should be made to sit erect and sponge the nose with ice-cold water, and it is perhaps an advantage to sit the patient in a draught, and place the feet in hot water.

If the hæmorrhage has been severe the patient must lie down, otherwise fatal syncope may result. In these severe cases the surgeon will probably plug the nostrils.

HÆMORRHAGE FROM THE TONSILS

After removal of the tonsils hæmorrhage is sometimes severe. The patient should be given ice-cold water to use as a gargle, or in the case of a child a sponge dipped in a hæmostatic such as adrenalin or tannic acid should be firmly pressed against the bleeding surface.

II.—INFLAMMATION

When any part of the body is injured a series of changes occurs in it as the direct result of the injury, and these changes will be similar, no matter which part of the body is injured, or what the cause of the injury may be. The term inflammation is used to cover all these changes, and it will be mild if the injury is slight, and severe if the injury is great. A fracture causes inflammation of the surrounding tissues and of the bone; a burn causes inflammation of the skin and soft tissues. Inflammation has therefore many causes, such as blows, the presence of foreign bodies, the action of chemicals, burns, and scalds, but there is one variety of cause that is of the utmost importance in surgery, and this is the inflammatory condition caused by micro-organisms or bacteria.

It is, however, convenient first to speak of inflammation due to other causes, and this will be discussed under the title of

ASEPTIC OR NON-BACTERIAL INFLAMMATION

When a part is injured certain changes occur in it which constitute inflammation, and the expressions of these changes are called the clinical (bedside) signs of inflammation.

The earliest changes occur in the blood vessels which become dilated,

whilst the blood-flow through them is quickened. The part, therefore, contains more blood than usual, and is redder and hotter than the surrounding tissue.

The serum of the blood then begins to pass out from the vessels and the tissues become swollen with fluid.

As the part is swollen its nerves are pressed upon, and it becomes painful, and there are now present the four classical clinical signs of inflammation—**redness, heat, swelling, and pain.**

A fifth evidence of inflammation is found in the **loss of function** of the part, which cannot work properly in its inflamed state. For example, if the kidney is inflamed it can no longer secrete the urine properly, and either suppression will occur or abnormal materials will be found in the urine.

In more severe inflammation, as well as the escape of serum (inflammatory lymph) from the blood vessels, there is also an escape of the white cells (leucocytes) of the blood. In the most severe types, especially if occurring in a soft tissue such as the lungs, the blood vessels rupture, and the red cells escape. This is known as hæmorrhagic inflammation.

In severe inflammation the first increase of the blood-flow is followed by slackening, and finally by arrest (stasis), and when this occurs the centre of the inflamed part becomes blue and congested, but round the dark coloured area is the bright redness of the earlier inflammatory changes.

Aseptic traumatic fever.—At the same time that the patient is showing these *local* signs of inflammation he is suffering from *general* or constitutional symptoms due to the absorption of certain poisons from the inflamed area. As these symptoms are associated with a rise of temperature they are termed fever, and as the inflammation is the result of an aseptic injury, the condition is spoken of as aseptic traumatic fever.

The substance which causes the fever is probably fibrin ferment. It is only found in blood after it has been shed, or escaped from the blood vessels, and it is the cause of the coagulation of the blood. Its effects on the body are—rise of temperature, headache, loss of appetite, constipation, and a feeling of illness. The symptoms only last for about forty-eight hours, and the patient is then well again.

The results of aseptic inflammation are :—

Resolution.

Fibrosis, or chronic inflammation.

Gangrene.

RESOLUTION

By this term is meant the restoration of the part to its previous healthy condition. As an example, a case of acute traumatic inflammation of the shoulder-joint may be taken. After the injury the joint is acutely inflamed and becomes hot, red, painful and swollen. It is not possible to move it freely, and the patient feels ill, and has a slight rise of temperature. In about two weeks, in a favourable case, all these symptoms have disappeared and the joint has recovered, no signs of inflammation being left. The inflammatory process has undergone resolution.

Like the symptoms, the treatment of acute inflammation must be both local and general, and its aim is to promote resolution.

Local treatment of acute aseptic inflammation.—The first step will be to remove the cause. Inflammation of the conjunctiva, let us say, will continue as long as the piece of dirt that caused it is left under the upper eyelid. If the shoulder-joint, again, is constantly being injured it will constantly be inflamed.

The injured part must then be put *at rest*, so that it may have time to recover, and if it is a limb that is inflamed, it should be rested in the elevated position so that the excess of blood in the part can easily drain out of the veins and lymphatics. This diminishes the swelling and the pain.

The upper extremity should be elevated on a splint fastened above the head, and the lower extremity by resting it on an inclined plane at an angle of forty-five degrees with the bed.

To cause the dilated vessels to contract, and to diminish the amount of serum that passes out through their walls, *cold* is often applied to inflamed parts in the first forty-eight hours. It can be applied by means of the ice bag, Leiter's coils, or evaporating lead lotion.

Ice bags and Leiter's tubes (see Vol. II., pp. 185, 186).

Evaporating lead lotion is a solution of subacetate of lead, to which spirit is added, so that it rapidly evaporates. This lotion is applied by soaking a piece of lint in it, and then placing it lightly on the part. The lint must be exposed to the air and kept constantly wet, and a piece of mackintosh should be placed under the limb to protect the bed.

During the later stages of inflammation, when exudation and stasis

have occurred, *heat* is frequently applied to inflamed parts so that the circulation is stimulated and resolution promoted. The heat also lessens the pain, and hot applications are usually exceedingly comforting to the patient.

Heat is generally applied by means of fomentations and baths. (To make a fomentation, *see* Vol. II., p. 189.) The fomentation must be much larger than the inflamed area, and the whole manipulation must be carried out rapidly so that as little heat as possible may be lost. If the fomentation is not wrung sufficiently dry, scalding will occur, dry heat being more easily borne than moist.

Instead of plain water various *antiseptic lotions*, such as carbolic acid (1 in 40), perchloride of mercury (1 in 1,000), lysol ($\frac{1}{2}$ drachm to the pint), are frequently used; or the fomentation can be made of lint containing powdered boric acid.

Drugs which relieve pain, such as opium or belladonna, are sometimes ordered with fomentations. The tincture of the drug ordered should be painted on the part, and the fomentation applied over it.

The various kinds of baths used in the treatment of chronic inflammatory processes are described on page 187, Vol. II. The congestion in an inflamed part may be relieved by *local blood-letting*. The surgeon will either make a free incision into the part or will order the nurse to apply leeches.

The application of leeches has fallen into disrepute in surgery, as the presence of leech bites makes the skin difficult to sterilise if an operation has to be performed later. The inflamed part is carefully cleaned, and the leech, held in a small glass, is applied to it. If the leech will not bite milk may be smeared on the skin, or a little blood drawn by the prick of a needle. The leech will usually drop off when it is full, but if it is necessary to remove it a little salt and water should be poured over the part. (*See also* Vol. II., p. 193.)

The bleeding usually continues after the leech has dropped off, but pressure will generally cause it to cease, and it may also be stopped by the application of one of the styptics mentioned on page 8.

General treatment of acute aseptic inflammation.—If the inflammatory process is at all severe the patient should remain in bed till the temperature is normal. The diet should be light and nutritious, and the bowels opened with a saline purge.

CHRONIC INFLAMMATION OR FIBROSIS

When the cause of the inflammation is not quickly removed, the process continues and becomes chronic. The cells of the surrounding tissue multiply, and there appear in the inflamed area a number of strands of fibrous tissue. This fibrous tissue steadily increases in amount so long as the inflammation continues, and after it has formed it contracts. This fibrous tissue (fibrosis) destroys the cells of the part, and may lead to serious consequences. For example, if both kidneys are chronically inflamed the fibrous tissue formed gradually supersedes the kidney cells till there are not enough cells left to carry on the function of excretion, and the patient will die from gradual accumulation in the blood of excretory products (uræmia).

In the case of joints and tendon sheaths the strands of fibrous tissue stretch between the different surfaces and prevent movement. Such bands are called adhesions. Adhesions also occur in the serous membranes, such as the pericardium and peritoneum. In the latter situation they may lead to intestinal obstruction by strangulating the gut.

Local treatment of chronic inflammation.—Besides the methods already given for the treatment of acute inflammation, the following further methods are used in treating chronic inflammation.

1. *Counter-irritation.*—By this is meant that a mild inflammation is started over a deeply inflamed part. For example, the skin over the knee is inflamed to benefit the inflamed synovial membrane of the joint.

Counter-irritation can be effected by liniments, tinctures, blisters, or ointments.

If a liniment is ordered to produce counter-irritation, it should be used sufficiently vigorously to produce redness and burning of the part but not vesication.

The most commonly used *tincture* is tincture of iodine. It should be painted thoroughly over the part with a brush.

Blisters are commonly used over inflamed joints, and can either be produced with the actual cautery, by painting the skin with liquor epispasticus or by the application of emplastrum cantharides.

If the plaster is used a piece a little smaller than the size of the blister required is applied on the cleaned skin. To apply the liquor the area to be blistered should be marked on the cleaned skin by a ring of olive oil, and the fluid painted on. A fomentation applied over the part

will assist the formation of the blister, which will usually appear in from six to twelve hours. When the blister is tense it should be pricked with scissors to let out the fluid, which must be caught on a piece of cotton-wool, and then the surface covered with boracic ointment.

The *ointment* most generally used to produce counter-irritation is the compound ointment of mercury, commonly known as Scott's dressing.

This ointment should be thickly spread on strips of lint about one and a half inches wide, and long enough to go well round the limb. The strips are applied diagonally round the limb, and then covered with strips of lead strapping in the way described under the head of Pressure. It may be left on for weeks, or if under plaster of Paris, for months, but in some cases will excite severe inflammation.

2. *Pressure*.—The object of pressure is to cause the absorption of the inflammatory exudation, and it can be applied in several ways, but the most efficient method is by strapping the part from below upwards with lead plaster. The limb should be cleaned and powdered with boric acid, and then cotton-wool used to fill up all the hollows so that the pressure is evenly distributed.

The strapping used should be one and a half inches wide, and cut into strips long enough to go round the limb, and slightly to overlap.

The limb is elevated for a few minutes so as to diminish the swelling, and then the strips of strapping are applied from below upwards. The strapping is put on diagonally, and the ends should overlap, and each strip should overlap by two-thirds the strip below. The strapping may be made to stick either by heating it or by smearing a little turpentine on the plaster side.

If the strapping is to be applied to the middle of a limb the part below should be bandaged to prevent œdema.

In removing plaster it is a mistake to pull it off slowly, it should be removed with a quick, sudden jerk. A little chloroform will readily remove the plaster from the fingers or the limb.

3. *Elastic bandages*.—Three kinds of these bandages are in common use—Martin's bandages, which are plain indiarubber, with or without perforations, elastic web bandages, and stockinette bandages. The last have no indiarubber in them, but are made of a cotton web. They can be washed.

All these varieties of bandages are put on evenly with spiral turns round the limb; no reverses or figure-of-eight turns are necessary.

Another form of pressure is massage, which is used to empty the inflamed part of blood and lymph, and to stimulate the walls of the arteries so that they contract. At the same time passive movements are performed which break down adhesions that are forming.

4.—*Baths* and *electrical treatment* are also largely used in the treatment of chronic inflammation.

General treatment of chronic inflammation.—This chiefly consists in giving suitable nourishing food and plenty of fresh air with appropriate drug treatment of any constitutional disease, such as gout or rheumatism, from which the patient may be suffering. Two drugs are largely used for their direct effect on inflammatory exudation—potassium iodide and mercury.

Gangrene will be considered at the end of the next sub-section (p. 17).

SEPTIC INFLAMMATION

When inflammation results from the action of certain micro-organisms it is called septic, and it not unfrequently ends in a breaking-down of the tissue to form pus, a process known as suppuration. The most common of the septic organisms are the staphylococcus and the streptococcus, and they usually cause acute suppuration.

Although all suppuration is due to the presence of bacteria, it must not be forgotten that many bacteria cannot cause suppuration, and even those that can, do not do so in every case. Micro-organisms can cause acute non-suppurative inflammation and chronic non-suppurative inflammation, as well as the suppurative form.

For example, the streptococcus injected into the skin can cause erysipelas, which is an acute inflammation that usually ends in resolution, whilst, deeply injected, it causes cellulitis, an inflammation which nearly always ends in suppuration.

When an inflammatory process suppurates, the centre of the zone of inflammation, where the bacteria are, undergoes degeneration. The white cells of the blood which have left the vessels die, the tissue cells die and disintegrate; fluid from the blood-vessels and the lymph channels collects in the part, and the result is the formation of a semi-liquid mass containing dead and dying white cells, broken-up tissue cells, and serum. This liquid is termed *pus*, whilst the tissue itself is said to have broken down into an *abscess*. If the process is rapid it is called an acute abscess,

and if slow a chronic or cold abscess. Of course the pus contains the organism that caused the abscess formation, and is therefore highly infective to other wounds.

When, therefore, inflammation goes on to suppuration, a fluid mass is formed in the centre of the inflamed area, giving it a curious fluid feeling which is called fluctuation, or else causing it to feel elastic.

Septic traumatic fever.—At the same time that this additional local sign is added to those of inflammation, the patient commences to suffer from the absorption of the poisons (toxins) produced by the growth of the organism. These poisons cause a rise of temperature, and a feeling of illness which is much more marked than in non-bacterial inflammation, and will continue as long as the toxins are absorbed, *i.e.* until a free exit is given to the poisons by opening the abscess and draining it. These general symptoms are termed septic traumatic fever, and besides the rise of temperature there are flushing of the skin, sweating, sometimes rigors, vomiting, constipation, or diarrhœa, rapid anæmia, and loss of flesh and strength. If free vent is not given to the pus the patient will die of septic poisoning.

Treatment of septic inflammation.—In the early stages of the inflammation the treatment is the same as in non-bacterial cases, for it is impossible to say whether suppuration will occur, and early and efficient treatment will sometimes prevent it.

Directly fluctuation is felt, or before in some cases, the surgeon makes a free incision into the part so as to evacuate the pus, and a drainage tube or a gauze drain is introduced so that the pus can readily escape to the exterior, and no longer be absorbed. Fomentations are then applied so as to hasten the removal of products of inflammation by keeping the part warm and moist, and so increasing the blood-flow and the healthy action of the tissues.

Antiseptics are applied to the part at the same time, either in concentrated form as pure carbolic, or diluted so as to kill the organisms as rapidly as possible and to render the wound aseptic.

Baths.—Fomentations rapidly get cool, so that if they are used to apply heat to an inflamed part the temperature constantly varies, and the method is not efficient.

A better way to apply heat is to place the inflamed part in a hot bath of a dilute antiseptic solution which can be kept at or about a constant temperature by adding more hot solution from time to time.

This method of applying heat is only suitable for the limbs, especially for the arms.

The bath must never be allowed to cool, but when adding fresh lotion the patient should first remove the limb from the bath, otherwise he may easily be scalded.

General treatment of septic inflammation.—This consists in getting the patient to take as much of a light and nutritious diet as possible, and placing him in the best hygienic surroundings, especially as regards fresh air and sunlight.

Stimulants, particularly alcoholic stimulants as port wine, burgundy, and brandy, are frequently ordered.

Injections of antitoxin or the opsonic treatment are given in some cases.

The opsonic method of treatment is at present on its trial, but the results obtained so far are encouraging. The technique is complicated, but briefly the principle is as follows: Opsonins are bodies which are manufactured by the tissues to counteract the toxins of the micro-organisms; and to encourage the manufacture of opsonins, sterilised cultures of organisms are injected into the body. The tissues respond by manufacturing more opsonins, and so the toxins of the organisms are rendered inert and the organisms themselves destroyed by the white cells of the blood.

GANGRENE

By gangrene is meant the death of a part of the body. If the soft parts alone are killed the condition is sometimes spoken of as *sloughing*, and the dead part is called a *spachelus* or *slough*. Death of bone is sometimes called *necrosis*, and the dead bone a *sequestrum*.

In cases of very severe inflammation the process may be so acute, and the number of blood-vessels affected so numerous, that the part dies.

The signs of death of a part are (1) change in colour, (2) loss of sensation, (3) loss of heat, (4) loss of pulsation, (5) loss of function. When a part is dead it must be removed, for it is no longer of any use.

This removal may be undertaken by Nature in one of two ways:

1. **Dry gangrene.**—The part becomes dried up and slowly separates from the living tissue, the process taking weeks or months.

2. **Moist gangrene.**—The part is moist and decomposing, and rapid separation takes place by the formation of pus between the living and the dead tissue.

Unfortunately, Nature is not always successful in separating the living from the dead tissue, and a case of moist gangrene may go on spreading. Moist gangrene is also septic gangrene, and the same septic condition is found as in the case of acute abscesses, so that death may occur from septic poisoning.

Treatment of dry gangrene.—In cases of dry gangrene all that is necessary is to keep the part dry and aseptic till Nature removes it. The part is wrapped in a dry antiseptic gauze and left, the gauze being changed from time to time.

Treatment of moist gangrene.—The surgeon can assist Nature in the treatment of moist gangrene in two ways :

1. In mild cases the part is fomented with warm antiseptic lotion. The warmth stimulates the rapid formation of pus between the living and the dead tissue, and so helps the speedy removal of the dead part, and at the same time the antiseptic checks the too rapid growth of the organisms.

2. In severe cases, and especially if it is spreading, the gangrenous part can be removed by an operation. For example, in moist gangrene of the foot occurring in an elderly person, the leg is usually amputated through the thigh.

III.—WOUNDS

A wound, technically defined, is a solution of continuity of any of the tissues of the body, but when the term "wound" is used without qualification it implies that the skin or mucous membrane is divided, and that external hæmorrhage has occurred.

Wounds may be caused by incisions with cutting instruments, punctures with pointed knives, lacerations with blunt crushing instruments, or by gun shots.

The appearance of the wound will vary with its cause, but the principles upon which treatment rests are the same for all.

The methods of treating wounds will vary according as to whether they are made during an aseptic operation, are caused by accident, or are already infected with micro-organisms.

A.—OPERATION WOUNDS

These are made with aseptic instruments, through aseptic skin, and should remain aseptic during the whole process of healing. If it has been possible at the time of operation to bring the edges of the skin together, and they do not subsequently become separated by suppuration

or gangrene occurring, the wound heals with a minimum of scar tissue. This method of healing is called **healing by first intention**, and it is the aim of the surgeon to get all his operation wounds to heal by this method.

Healing by first intention is completed in about ten days.

In cases in which the skin surfaces cannot be brought into apposition, or where subsequently suppuration or gangrene has occurred causing separation, a large amount of scar tissue is formed, and the wound is said to heal by **second intention** or **granulation**.

The chief cause of the failure to get first intention healing is the infection of the wound by certain micro-organisms which cause suppuration. There are many organisms which can cause wounds to suppurate, but they all go by the name of septic organisms, and a wound that is infected by them is said to become septic. If a wound becomes septic the edges of the skin are separated by the formation of pus, and the process of healing is delayed, sometimes for weeks or months.

Besides this delayed healing and the deformity from excessive scarring, the patient is poisoned by absorption of the toxins of the bacteria, and death may result from this cause. The patient is said to die from **septicæmia**. During the performance of an operation the surgeon may shield his wounds from the attacks of these organisms in two ways :

1. He excludes all organisms from the field of the operation by washing his hands and the skin of the patient, by boiling all instruments, and by subjecting his dressings, towels, etc., to high temperatures, so that all the organisms are killed. This is spoken of as **asepsis**.

2. He kills all the organisms coming into the field of operation by the use of certain chemicals called **antiseptics**. The aseptic method is more relied upon at the present time than the antiseptic, and in modern operating everything is first rendered as sterile as possible by washing, boiling, and dry heat, and then mild antiseptics are used during the operation to kill any organism introduced by faults in technique, and as an additional safeguard.

Antiseptics also have the disadvantage of being injurious to the skin and tissues of the patient, so that the subsequent inflammatory reaction is greater in wounds treated by the antiseptic method than in those treated by asepsis.

Asepsis.—The various methods of rendering the air of the operating room, the hands of the nurse, and the skin of the patient as sterile as possible are described in the section on operations (p. 55). The methods

of rendering aseptic instruments, ligatures, sutures, sponges, bowls, trays, coats, towels, dressings, swabs, and mackintoshes, will be considered here.

Instruments.—These should be boiled in a steriliser for fifteen minutes before each operation.

The water in the steriliser should contain one per cent. of carbonate of soda, and should be boiling before the instruments are placed in it. The instruments are removed from the steriliser in the special tray, or with freshly sterilised forceps, and either placed in a sterile tray containing 1 in 40 carbolic lotion or on a sterile towel.

They should not be touched by anyone who has not rendered his hands sterile first, and not even then without the consent of the operator.

If an instrument is required hurriedly during the course of an operation it is sufficient to boil it for three minutes if it has been sterilised before putting it away, and it should be remembered that the operator is seldom in such a hurry that he cannot wait for the three minutes.

Knives should not be boiled with the other instruments, as boiling blunts them. They should (if previously cleaned) be boiled for thirty seconds only, and should be wrapped in a piece of lint, or placed on a piece of indiarubber tubing in the steriliser to prevent them from bumping. After being boiled, knives should be kept in a solution of lysol and spirit, 1 in 3. When wanted, they are removed from the solution with sterilised forceps, washed in a weak antiseptic, and placed in the instrument tray. If convenient, it is an advantage to have a small special tray for the knives. If a knife is wanted for an operation in a hurry it should be boiled, like other instruments, for three minutes.

Needles should be treated in the same way as knives. Before being boiled they should be stuck through a piece of lint so that they do not become blunted, and may be easily found among the other instruments. They may be kept in strong lysol and spirit, and then they will not need boiling just before the operation.

Ligatures.—Silk is boiled in the hank for twenty minutes, and then put into absolute alcohol for twenty-four hours. It should next be wound on sterilised glass reels and boiled again for twenty minutes. It can then be stored in absolute alcohol. After each operation it should be re-boiled for ten minutes.

Catgut or kangaroo tendon can be sterilised in the following manner : The ligatures are placed in a mixture of 20 per cent. aqueous solution of chromic acid to 5 parts of glycerine, and left for from one to

ninety-six hours, according to the durability required. After they have soaked for a sufficient time they are rinsed in sterile water, dried on a sterile towel, and then placed in a 20 per cent. solution of carbolic acid and glycerine. They are ready for use in fourteen days. Other methods may be used, but the above will be found to give satisfactory results.

Sutures.—Silkworm gut can be obtained in five sizes, coloured to indicate the size. It is sterilised by boiling for thirty minutes in a steriliser, and afterwards should be removed with sterile forceps and kept in 1 in 20 carbolic lotion.

About ten strands should be sterilised at a time, and any left over from an operation must be boiled again before it is used.

Sponges.—Commercial sponges contain sand and calcareous particles, and these must be removed by thorough washing and by picking them out with forceps. After the sponges are quite clean—and this requires frequent changes of water and careful inspection—they are washed in a strong solution of common soda and lukewarm water and transferred to jars containing a 5 per cent. solution of carbolic acid and water.

They will be ready for use in twenty-two days, but immediately before being used they should be transferred to a bowl containing sterilised water or any weak antiseptic the surgeon may order.

Bowls and trays should be sterilised by boiling. *Coats, towels, dressings, etc.*, are best sterilised by dry heat, and this can only be carried out in a special steriliser. They should be loosely packed in tins the lids of which are left open, placed in the steriliser, and kept at a temperature of 280° F. for half an hour. All dressings not used for the operation must be re-sterilised.

Mackintoshes.—The best forms of mackintosh for use during operations or dressings are light patent preparations such as Baptiste cloth, pegamoid, etc. They can be readily sterilised by boiling. The heavy mackintosh frequently used is clumsy, and cannot be properly sterilised. To render it as sterile as possible it should be scrubbed with soap and water, and then carbolised with 1 in 20 carbolic lotion.

Gloves.—Indiarubber gloves are sterilised by boiling. Before being sterilised they should be filled with water in order to detect any minute holes in them, and if these are found the gloves must be regarded as useless. Each pair of gloves should be wrapped in lint and placed under the water in the steriliser, so that they do not touch the sides.

Course of an operation wound.—After an aseptic operation in which the edges of the wound have been brought together by sutures, there is no need to interfere with the wound until healing is complete, unless a drainage tube has been inserted. A drainage tube is used in aseptic wounds to get rid of any excess of serous exudate (inflammatory lymph) which may be present. Drainage tubes are therefore used in those cases where there has been much tearing of the tissues or where antiseptics have been employed freely, for in these cases the inflammatory reaction is likely to be severe. Drainage tubes are removed from aseptic wounds in from twenty-four to forty-eight hours.

If no tube is used there is usually some aseptic traumatic fever for the first forty-eight hours. The temperature may rise to 100° F. No notice need be taken of this beyond keeping the patient in bed and giving him a light diet.

Dressing an operation wound.—A wound that has healed by first intention should not be disturbed for eight to ten days unless a drainage tube has been used. At the end of this time the stitches should be removed, unless absorbable catgut sutures have been employed. These do not need to be removed, but the wound should be re-dressed and healing should be complete.

The strictest aseptic precautions should be used when dressing wounds; all the instruments should be sterilised, and the hands as carefully washed as for an operation.

When the surgeon decides to dress the wound, a pair of scissors, a pair of forceps, and a probe should be sterilised and placed in 1 in 40 carbolic lotion in a sterile tray.

The bed-clothes should be turned down and covered with mackintosh, and the bandage removed.

A box containing sterile towels, swabs, and a fresh dressing, should be ready and handed to the surgeon with the lid open.

If the nurse is dressing the case, everything should be got ready first, and then the hands carefully washed. The wound is now surrounded with sterile towels. No lotion should be used to soak off the dressing (unless it is very difficult to remove it), so that the wound may be kept dry, and the wound and skin should not be touched by the fingers.

There is no need in a clean aseptic wound to use any swabs or lotion, and it is harmful to do so as bacteria grow most readily on a moist surface, and a dry wound is less likely to become infected than a moist one.

The stitches are removed by pulling them a little out of the skin with the forceps, and then cutting them on one side. This small operation should be practically painless.

After all the stitches are removed the wound is re-dressed with a small light sterile dressing, which should be retained for another week. No further dressing is required.

B.—ACCIDENTAL WOUNDS

Accidental wounds are made with surgically dirty instruments, through surgically dirty clothes and surgically dirty skin. Very often actual visible dirt is ground into them, and it may be taken as an axiom that any large accidental wound is infected with organisms at the time it is made. This especially refers to wounds in dwellers in towns.

First-aid treatment of accidental wounds.—The treatment of hæmorrhage has been already described in Section I. of this chapter, and bleeding must first be arrested, but in the process the rules of asepsis should be carried out as far as possible.

It should be remembered that everything at hand—the fingers, handkerchiefs, rags, water, etc.—is likely to be septic, while the tissues wounded are aseptic, and it will then be seen that nearly everything applied to wounds is likely to cause harm. The ideal dressing would be a sterilised one, but this is little likely to be at hand, and as a substitute any freshly washed linen can be used. If the bleeding has ceased and a large cake of coagulated blood covers the wound, this should not be wiped away, as it forms a good aseptic dressing of Nature's providing.

If possible the nurse should always wash her hands before touching the wound, and hæmorrhage is really the only emergency with which she has to cope.

An exception to not washing wounds is made in those cases in which earth—particularly garden soil—is found in the wound. This should be washed away, as it frequently contains the deadly tetanus bacillus, which, if not removed, may cause death in a few days.

Before washing such a wound some weak antiseptic should, if possible, be added to the water, such as spirits of wine, and the surrounding skin may be cleaned with a little turpentine.

If the case is first seen in hospital, and the bleeding has ceased, the nurse should remove all the dirty dressings which have been applied by the patient's friends, and then wash her hands thoroughly. The

surrounding skin is next washed, and the wound bathed in a dilute antiseptic, and covered with a sterile dressing, which may be moistened with 1 in 1,000 perchloride of mercury.

If the bleeding has not ceased it will often be found that an imperfect tourniquet has been applied, which constricts the veins and not the arteries, and so increases the hæmorrhage. This should be removed and re-applied properly, and the surgeon sent for at once.

In the further treatment of accidental wounds the surgeon will endeavour to render them and the surrounding skin aseptic, so that he may be able to treat them as operation wounds. An anæsthetic is frequently necessary to do this properly, and the operation should be conducted with full aseptic precautions. Healing will occur readily if this treatment is successful, but there is, of course, a great liability for accidental wounds to become septic.

C.—INFECTED WOUNDS

A wound may be already infected, before it comes under treatment, with organisms, such as the streptococcus and the staphylococcus, which cause it to suppurate, and it is then said to be septic.

The edges of the wound will be red and swollen, healing will cease, and there will be a constant discharge of pus.

The patient's temperature will be raised, and he will show signs of poisoning by the toxins of the organism.

Septic wounds may either be operation wounds, or accidental wounds in which aseptic treatment has not been carried out, or has failed. They are also common in people who perform *post-mortem* examinations, whilst nurses not unfrequently get infected whilst dressing septic cases. A prick from a pin whilst dressing a case of cellulitis is sufficient to cause a septic wound of the finger which may prove fatal from septicæmia (blood-poisoning) or lead to amputation of the arm to save the patient's life.

Dressing infected wounds.—An infected wound should be dressed with the same aseptic precautions as are used for dressing aseptic wounds, for it is the aim of the surgeon to render septic wounds aseptic, and this is not possible if fresh infection occurs each time the wound is dressed, or a septic wound might also be infected with the tetanus bacillus, and lock-jaw result. Considerations of expense and time, especially in hospital, may not allow the elaborate precautions used in dressing aseptic

wounds to be carried out in the frequent dressings necessary for septic wounds, but the principles of asepsis should never be transgressed, and above all the nurse's hands must be thoroughly washed before and after each dressing. Septic dressings should never be touched with the fingers—forceps always being used, and if the nurse has to dress both septic and aseptic cases, indiarubber gloves that can be boiled between each dressing are valuable adjuncts to asepsis, as the hands are kept from actual contact with septic material.

When the dressing has been removed all the pus should be carefully wiped away with swabs wrung out in some antiseptic fluid, and if the wound is very foul or there is a deep cavity it should be cleaned by syringing. Cyanide gauze is frequently used to dress septic wounds, and it should be applied slightly damp. The piece of gauze next to the wound should be wrung out in 1 in 40 carbolic lotion, and then dry gauze and cotton-wool placed over it. Fomentations are also frequently used.

Sinuses.—If a wound does not heal at the bottom, but continues to discharge pus through a small opening in the skin, a sinus is said to be present. A sinus persists because there is something at the bottom of the wound which prevents healing, such as a foreign body (bullet, suture, piece of cloth), or a piece of dead bone.

The sinus will continue to discharge until this substance is removed.

Dressing a sinus.—A sinus must be kept open till the cause of its persistence is removed, otherwise the pus will collect and form an abscess. At the same time the pus must be enabled to come easily to the surface. To obtain these objects gauze drains are used. A slip of gauze is passed down the sinus to the bottom, and renewed daily, or every other day; the gauze prevents the mouth of the sinus from closing, and the pus runs up it by capillary attraction.

A sinus should not be “plugged,” for if gauze is forced into it the pus is prevented from escaping, and an abscess is formed.

After the drain is introduced the wound is dressed in the usual way.

There is no need to syringe out a sinus unless the discharge is very foul. The usual method of syringing these sinuses vigorously with an antiseptic fluid each day is wrong, as the antiseptic merely irritates the wound without doing any good. Sinuses of the breast, for instance, may be prevented from healing by constant syringing.

A **fistula** is an opening from one of the tubes of the body on to the skin or into another cavity. For example, there may be a small opening

from the alimentary canal on to the skin, fæcal fistula; or into the bladder, vesico-intestinal fistula.

Fistulæ usually require surgical treatment before they will heal, and the sole reason for dressing them is to keep them clean.

IV.—FRACTURES

A fracture is said to be present when a bone is broken. The fracture may occur in a normal bone from violence, or the bone may be first

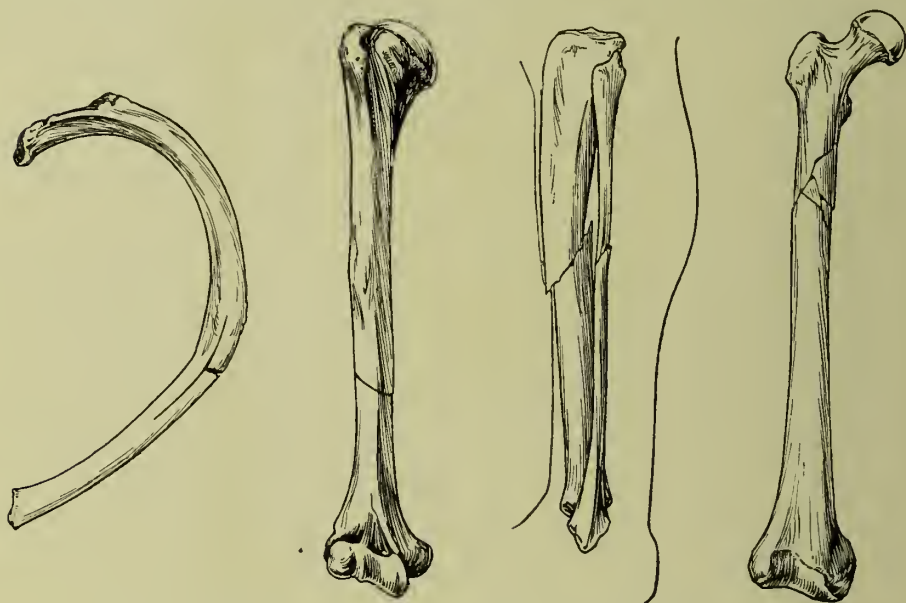


Fig. 72.—GREENSTICK, SIMPLE, COMPOUND AND COMMUNUTED FRACTURES.

diseased, and the violence that breaks this bone may be so slight that it is not noticed. The latter kind of fractures are known as **spontaneous fractures**, and usually require different treatment from the first variety.

If the bone is broken without the periosteum—the membrane that covers it—being torn, the fracture is called *interperiosteal*, and the displacement of the fragments is slight.

Greenstick fractures occur when a bone is partly broken and partly bent, the break always occurring on the convexity of the bend. They only occur in the bones of children, and usually in children suffering from rickets. (Fig. 72.)

Fractures are called **simple** (Fig. 72) when the bone only is broken and no serious damage is done to surrounding parts, while if other structures are involved, such as important nerves and vessels, the fractures are said to be **complicated**.

Compound fractures are fractures which are complicated by an external wound so that the fragments directly communicate with the air (Fig. 72). Suppuration in the wound frequently leads to death of part of the bone and non-union of the fragments. If the bone be broken into more than two fragments the fracture is said to be **comminuted** (Fig. 72). Should one fragment of the bone be driven into the other so that it can only be separated by force, the fracture is **impacted**.

Delayed union of a fracture means that union has not taken place in the usual time, and if the time exceeds one year the fracture is said to be **ununioned**.

Separated epiphyses.—In young bones there are two distinct parts, the diaphysis and the epiphysis. The diaphysis is the shaft of the bone, and an epiphysis is usually found at either end (Fig. 73). Between the diaphysis and each epiphysis is a layer of cartilage from which the growth of the bone takes place. When growth

is finished—that is about the age of twenty-one—the layer of cartilage disappears, and the epiphysis becomes firmly fixed by bone to the diaphysis.

Before the age of twenty-one an epiphysis may be separated from the diaphysis by such violence as would in an adult cause a fracture. The separation takes place just below the layer of cartilage, and the accident is spoken of as a separated epiphysis.

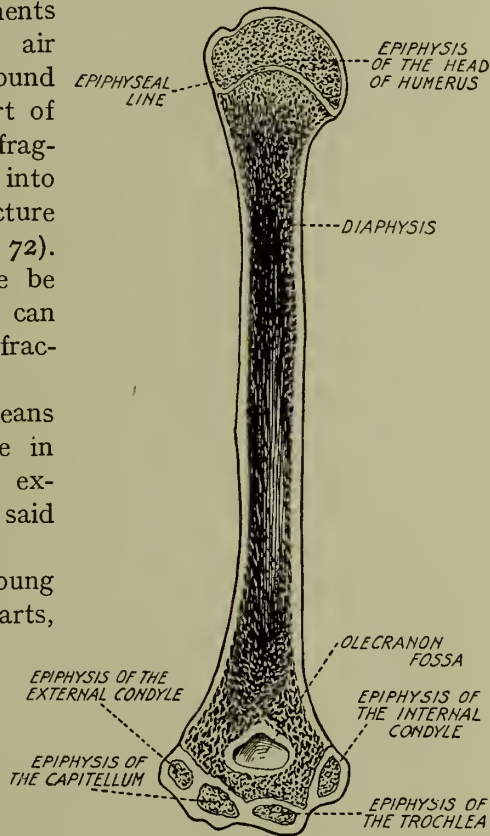


Fig. 73.—SECTION OF LEFT HUMERUS, SHOWING EPIPHYSES.

The violence that causes a fracture is said to be **direct** if the fracture occurs at the place struck. If the fracture occurs in another part of the bone or in a different bone to that struck the violence is called **indirect**. Thus a direct fracture of the femur occurs if the wheel of a cart goes over the thigh and breaks the bone, while an indirect fracture of the neck of the femur may occur from an elderly patient tripping over a piece of carpet, the bone breaking before the patient falls to the ground. In some cases the bone is broken by the violent contraction of the muscles, and this fracture is said to occur from **muscular violence**. As an example of this the fracture of a rib by sneezing or coughing may be taken.

Union of fractures.—Fractures usually unite by bone, the bond of union being called callus. Callus is always formed in excess of the need, and the more a fracture is allowed to move and the less accurate the apposition of the fragments the more callus is formed. After the ends of the bone have united firmly the excess of callus is re-absorbed. If the fragments of the bone have been placed in correct position it would be difficult to say some time after the accident that fracture had occurred, but in the majority of cases there is some slight deformity which remains for the rest of the patient's life. In some cases the deformity is excessive and leads to great shortening of the limb.

After some fractures, especially if the fragments are not brought together, the ends of the bone unite by fibrous tissue, and no bone is formed. This is common in cases of fractured patellæ which are not united by wiring. The condition may be serious or of no great importance.

Non-union of fractures occurs, as has been said, in some cases. The ends of the bone become rounded off, and there is no attempt at the joining of the two surfaces. In some instances, such as in fracture of the tibia and fibula, amputation may be necessary, the limb being quite useless. A special form of non-union is when a false joint forms between the two fragments. This is particularly common in fractures of the middle of the shaft of the humerus.

Diagnosis.—The diagnosis of a fracture may be very simple or very difficult, but in all cases in which a patient has sustained such severe injury that a fracture is suspected the nurse should render first aid as if a fracture were present. If no fracture exists no harm is done by the over-precaution; but if a fracture is present and neglected the consequences may be serious. Fractures are diagnosed by the pain produced on moving



FRACTURE OF TIBIA AND FIBULA.



FRACTURE OF FEMUR.

the bone, the alteration in shape and measurement of the limb, the deformity which occurs, and by crepitus. The last sign, a crackling sound, is obtained by the movement of the two fragments on one another. It may be simulated by tendon and joint disease, but if definitely felt is diagnostic of fracture.

FIRST AID IN SIMPLE FRACTURES

If the fracture be in the lower limb the patient must be prevented from attempting to walk, and if in the upper he should be warned not to attempt to move it. As soon as possible the two fragments should be immobilised between temporary splints, so that movement of the two fragments is impossible. This will prevent an incautious movement of the patient from driving the fragments of the bone through the skin, and so producing a compound fracture, and will save him much pain.

These temporary splints can readily be improvised from walking sticks, umbrellas, broom-handles, folded newspapers, bottle straws, etc., and handkerchiefs, scarves, and neck-ties may be used as temporary bandages.

In moving the limb to place it on the splints both fragments should be supported in the hands, and gentle traction made so as to hold the fragments firmly and to prevent movement.

In applying splints in the first-aid treatment care should be taken to immobilise the joints above and below the seat of the fracture.

Fracture of the tibia and fibula.—Long flat splints should be applied to the inner and outer side of the leg, reaching from above the knee to below the foot. If only one splint can be obtained it should be placed on the outer side. Bandage the splint on above the knee, below the knee, and round the ankle. (Plate XL.)

Fracture of the patella.—There is no real need to apply a splint after this injury, as there is no chance of the fracture being made compound. If a splint is used it should be a long one reaching from above the middle of the thigh to below the knee. It should be placed on the back of the limb and secured with bandages. The leg may be kept elevated.

Fracture of the femur.—A long splint reaching from the axilla to below the foot is applied on the outer side of the limb, and a second splint on the inner side. This second splint should reach from the perineum to the knee.

The splints should be secured with bandages round the chest, the upper

and lower part of the thigh, and round the ankle, the two lower extremities can then be bandaged together. (Plate XL.)

Fracture of the clavicle.—Remove the coat and waistcoat, beginning with the sleeve of the sound side and support the injured limb during removal of the sleeve on that side. Place a large soft pad such as a bath sponge in the axilla, and then bend the forearm and support it in a large arm sling. Bandage the whole arm to the side. The bandage should not go above the middle of the humerus. (Plate XLI.)

Fracture of the radius and ulna.—The elbow is bent to a right angle with the arm, the thumb being kept uppermost, and the palm of the hand towards the body. Two broad splints are then applied to the front and back of the forearm, and secured with bandages above and below the seat of the fracture. The limb should then be supported in a large arm sling. (Plate XLI.)

Fracture of the olecranon.—Support the arm in a large arm sling.

Fracture of the humerus (Plate XLII.).—1. *Close to the shoulder joint.*—Bandage the humerus firmly against the chest and support the forearm in a small arm sling

2. *Middle of the bone.*—Bandage four small splints round the arm and support the forearm in a small arm sling. If no splints can be obtained bandage the arm to the side and support the forearm as before.

3. *Lower end of the humerus and other fractures near the elbow.*—Take two pieces of flat wood, one long enough to reach from the axilla to just below the elbow, and the other long enough to reach from the elbow to below the fingers. Tie them together so as to form a right angle and apply the angular splint thus made on the inner side of the limb with the elbow bent. Secure this above and below the seat of fracture and support the forearm in a small arm sling.

Fractured ribs.—If there is no hæmoptysis the chest should be firmly bandaged, but if bleeding from the lung is occurring the patient should be placed sitting up and slightly inclined to the damaged side.

In all cases the arm on the injured side should be supported in a large arm sling.

Large arm sling.—This is made with a triangular bandage. The apex of the bandage is placed under the elbow, and the ends carried round the neck either directly or crossed and tied in a reef knot. The apex of the bandage is folded neatly round the elbow and secured with a safety pin.



FRACTURE OF THE CLAVICLE



FRACTURE OF THE RADIUS AND ULNA



Small arm sling.—One end of a triangular bandage folded to form a broad bandage is placed over the shoulder on the sound side, and the bandage then runs down, crosses the forearm just below the middle, and is carried round the neck on the injured side, where it is tied.

FIRST AID IN COMPOUND FRACTURES

Attention should first be given to the hæmorrhage, as set out in Section I. of this chapter, and to the wound, which should be treated in the manner described on page 23, and the fracture is then treated as a simple one.

Complicated, greenstick, comminuted and spontaneous fractures, also separated epiphysis, should all receive similar first-aid treatment to simple fractures. When the surgeon sees the fracture he will probably at once reduce the deformity (set the fracture) and apply extension and splints so as to maintain the corrected position. An anæsthetic may or may not be given.

Extension apparatus.—This apparatus is most commonly used in the treatment of a fracture of the femur. (Plate XLIII.) Two strips of lead plaster are taken, each about six inches longer than double the length of the limb from the site of the fracture to the sole of the foot.

In the middle of one slip is placed an oblong piece of wood which is a little wider than the sole of the foot, and the second slip is laid over the first so that the wood is enclosed between the middle of the two pieces. For an adult the width of the plaster should be two and a half inches, and for a child about one and a half inches. A hole is bored in the centre of the piece of wood.

The two bands of the extension are laid one on either side of the limb so that the upper ends reach almost to the site of fracture, whilst the wood projects about three inches below the sole of the foot.

The bands are fastened to the limb by cross pieces of strapping applied from below upwards. The bony prominences of the malleoli are protected by a layer of cotton-wool, and the strapping must be applied evenly, and without wrinkles.

To the piece of wood a cord is attached which passes over a pulley fixed to the end of the bed, and to which a weight is attached. The object of the extension is to exert a constant pull on the muscles of the limb, and the nurse should see that the weight is not resting against

anything, and that the patient's foot or the splint is not touching the end of the bed.

The plaster may cut the patient's skin and cause a sore. Any complaint of pain should be reported to the surgeon.

The weight of the extension should not be removed on any pretext without the surgeon's permission.

BED FOR NURSING FRACTURES

If the nurse has any choice in this matter she should select a bed as near as possible to that to which she is accustomed in hospital. It should be narrow, so that the patient can be attended to from either side, and should have a horse-hair mattress on it. Under the mattress should be placed a fracture board to keep it level in cases of fracture of the lower limbs, or in fractured spine. The pulley which is found over most hospital beds is also convenient in some cases, but it is liable to abuse by the patient.

If the nurse has to undress a patient who is suffering from a recent fracture she must be most careful in her manipulations, as much harm can be done. The clothes should be removed from the sound limb first, and the injured limb supported as the clothes are removed from it. It may be necessary to cut the clothes to remove them, and if so they should be cut along the seams. The temporary splints should not be touched until the surgeon has seen the case, and ordered their removal. An exception to this rule is made in hospital, where it is customary for the splints to be removed by the nurses, but the case has usually been seen by a surgeon on admission. In private cases the rule should never be broken.

After the splints have been removed the limb should be well washed with soap and water, sponged with a 1 in 1,000 perchloride of mercury lotion, and dusted with boric powder. If the fracture is not "set" at once the limb should be covered with a fracture cloth and supported between sandbags in a comfortable position. A bed-cradle should take off the weight of the bed-clothes, and if the patient is a child he should be fastened down in bed.

SPLINTS

Splints are of two kinds, movable and immovable. **Movable splints** are made of metal, wood, gutta-percha, felt, etc., and of various shapes



1.



2.



3.

FRACTURE OF THE HUMERUS.

PLATE XLII.—FRACTURES OF THE HUMERUS—UPPER END, MIDDLE
AND LOWER END.

adapted to their use. They are frequently named after the surgeon who invented them.

Metal and wooden splints require padding before they are applied, in order that there may be an even elastic pressure which is not likely to cause sores, and the best material to use is padding wool, but a mixture of cotton-wool and tow, or plain cotton-wool, may be used if the padding wool is not obtainable. Whatever material is used it should be sterilised and covered with soft old linen or unbleached calico. Splints that are likely to get wet with any discharge from a wound or from urine should be covered with jaconet or gutta-percha tissue, as this can be readily cleaned, and if any urine or discharge soak into the splint it must be changed. Splints may be covered with boracic powder so as to prevent decomposition of the sweat.

Wooden splints are cleaned by rubbing them with turpentine and scrubbing them with soap and water, whilst metal splints can be cleaned either by boiling or washing. Splints should never be used for a second patient until they have been thoroughly cleaned, and should always be freshly padded.

Gutta-percha can be moulded to the part requiring splinting by soaking it in hot water, whilst poro-plastic felt is best softened by dry heat.

Immovable splints are made of plaster of Paris, silicate of soda, starch, and gum and chalk.

These splints can readily be made movable if desired.

Plaster of Paris bandages are now sold already prepared for use, but the nurse should know how to make her own. The most suitable bandage is made of soft crinoline muslin, and the dry plaster is rubbed into both sides of it. The bandage should be loosely rolled by hand, and kept quite dry, as damp rapidly spoils the plaster.

The following should be got ready for the application of a **plaster of Paris splint** :—

Plaster bandages.

Dry plaster of Paris.

Olive oil or vaseline for rubbing on the limb and the surgeon's hands.

Two basins, one containing sufficient warm water completely to cover the bandages, and the other for mixing the plaster.

A flannel bandage or cotton wool for placing round the limb under the plaster.

When putting on a plaster bandage it is well to cover the hands

with vaseline, as the plaster will then be easily cleaned off, or a little crystalline sugar may be used instead of soap for washing the hands after the plaster is finished.

Various forms of plaster of Paris splints are made by soaking house flannel in a thick cream of plaster and then applying it to the limb and leaving it to dry.

The most commonly used of these is Croft's splint, and the nurse should get the following articles ready:—Four pieces of house flannel roughly cut to the shape of the limb, and of such a size that two of them form a complete case; four pieces of lint to correspond with the flannel, but slightly larger; three basins, one with warm water, and the other two for preparing the plaster of Paris cream, which is made by slowly adding fifteen ounces of plaster to half a pint of water; olive oil; two linen bandages.

After the surgeon has applied a plaster of Paris splint the nurse should place hot-water bottles by the side of the limb so as to hasten the drying, and she should see that the patient does not move the limb until the plaster is set.

Silicate splints.—These splints are made in a similar manner to plaster splints, but silicate of soda is used instead of plaster of Paris.

Starch splints.—These are made of millboard and bandages soaked in a strong solution of starch. They are rarely used now, as plaster of Paris answers every purpose and is much more readily applied.

Gum and chalk stocking.—The gum and chalk solution is made by adding fifteen ounces of a strong solution of gum to one pound of powdered chalk. The mixture is left to stand for twelve hours, and then thoroughly mixed. The other articles necessary to make the splint are:—Three white cotton stockings of increasing sizes, the smallest snugly fitting the leg, a piece of tape twice the length of the limb, some melted paraffin wax, olive oil, and a cradle for swinging the leg.

After the splint is finished the limb should be surrounded by hot-water bottles to hasten drying.

Pressure sores.—Whatever kind of splint is used in the treatment of fractures the nurse should always be on the watch for excessive pressure. After the splints are applied the limb frequently swells, and the bandages may become so tight as to cause gangrene of the part. The patient may not complain much of the pain, as after a time the part becomes anæsthetic.

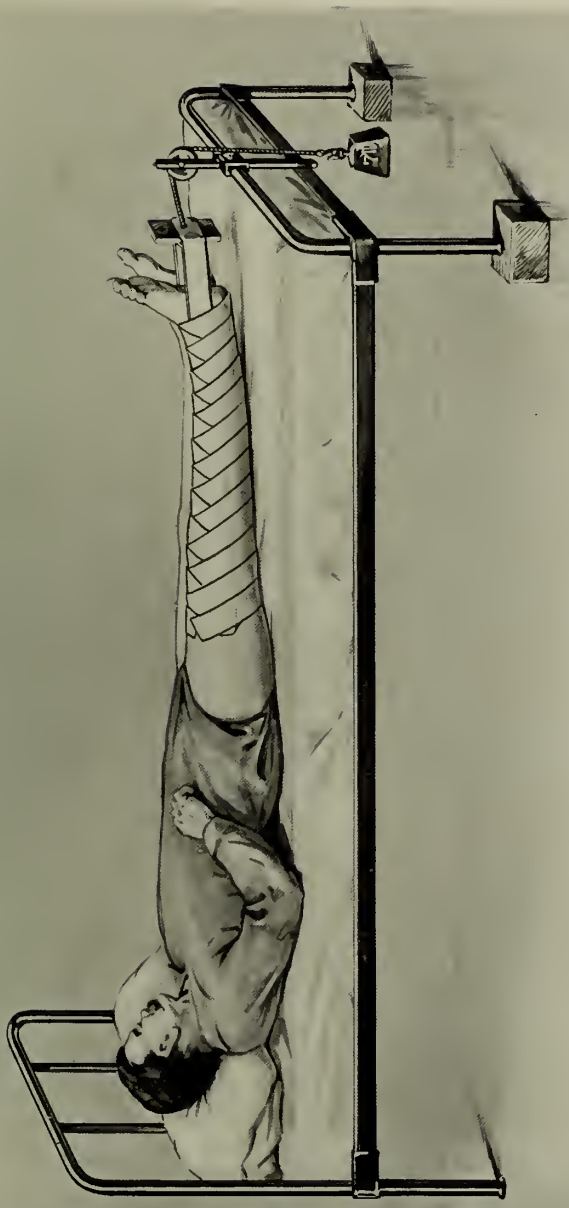


PLATE XLIII.—EXTENSION APPARATUS

The condition of the circulation can be ascertained by the colour of the part beyond the splint.

In the case of the leg, for instance, the toes will become congested if the pressure is excessive. Light pressure should be made on one of the toe nails, and the nurse should note if the colour quickly returns when the pressure is removed. If the nurse has reason to suspect undue pressure she should at once inform the surgeon.

Bed-sores are often very difficult to prevent in cases of fracture. The patient has to lie still in one position, and in such cases as fractured femur is very helpless. The danger of bed-sores is increased if the patient become delirious, as he may shift himself about till he appears actually to rub the skin off his back. The usual precautions are necessary.

FRACTURED SPINE

Fractures of the spine may be either incomplete or complete.

Incomplete fracture occurs when one of the bony processes of the vertebræ are broken but the spinal column as a whole remains intact. These fractures are of no great consequence unless they are complicated by injury to important structures.

Complete fracture occurs when the spinal column is broken into two pieces. The fracture passes through the body of one of the vertebræ, and then the upper part of the column is dislocated forwards on to the lower part, so that the injury is a fracture-dislocation. True dislocation can also occur in the cervical region, but in the dorsal and lumbar region the intricate way in which the vertebræ are articulated together makes it impossible for a dislocation to occur without fracture occurring at the same time.

Fracture of the spine has the same symptoms, diagnosis and treatment as fracture of any other bone of the body, and its special importance arises from the simultaneous injury that occurs in the spinal cord.

The severe blow that is necessary to fracture the short, strong vertebræ at the same time damages the soft spinal cord lying in the spinal canal, the cord is crushed, hæmorrhage takes place into it, and its conducting power is lost.

As a result of the loss of conducting power no impulse can pass from the brain to the parts supplied by spinal nerves below the seat of injury, and no impulses can pass from those parts to the brain.

The power of moving the muscles below the seat of injury goes, and no sensation can pass up to the brain, or in other words the patient is paralysed and completely insensitive in those parts supplied by the spinal nerves below the injured portion of the cord.

This loss of movement and anæsthesia apply to the muscles and mucous membrane of the bladder and rectum, as well as to the muscles of the limbs and the skin. As a consequence the patient has no knowledge when the bladder and rectum are full, and the discharges take place involuntarily.

One of three kinds of **incontinence of urine** may be present.

1. *Incontinence with an empty bladder.*—The sphincter action of the bladder is lost, and the urine no sooner flows into it from the ureters than it leaves by the urethra. The patient is constantly wet with a dribbling incontinence.

2. *Automatic action.*—If the group of nerve cells in the cord presiding over the act of micturition is intact, then the normal act of micturition will take place involuntarily.

The urine will enter the bladder from the ureters, and when this receptacle is sufficiently full an impulse will come down from the spinal cord, and the bladder will discharge its contents.

The only difference between this automatic action and normal micturition is that the patient is quite unconscious of any desire to pass urine, and of the fact that it has been passed.

3. *Incontinence of overflow, or false incontinence.*—The bladder fills from the kidneys, but the sphincter of the bladder remains contracted. After a time the pressure of the urine forces a way through the sphincter, and a dribbling incontinence starts, but the bladder remains full. If a catheter is passed, two or even three pints of urine may be drawn off. The patient feels no pain from the distended bladder.

The action of the rectum is similar to that of the bladder, but the phases are not so readily recognised. The patient is not conscious of desire to defæcate or of the act.

In cases where a pregnant woman has fractured her spine the confinement has been quite normal, but without the patient being conscious of it.

Bed-sores and cystitis.—Another point of importance in cases of fractured spine with damage to the cord is the great danger of bed-sores and inflammation of the bladder. The patient is insensitive ;

he is not conscious of slight injuries such as are caused by a too hot water bottle or a ruck in the sheet, and at the same time, being paralysed, he lies like a log in one place, which is therefore subjected to continuous pressure. Besides this the loss of nerve supply is associated with defective nourishment of the skin, and inflammation once started is very difficult to check. In some cases a serious bed-sore will develop in twenty-four hours.

For the same reason inflammation of the bladder, if once started by a septic catheter, will tend to spread to the kidneys, and this is a frequent cause of death.

Respiration.—Another cause of death in cases of fractured spine is interference with respiration.

If the injury is at or above the fourth cervical vertebra, death is almost instantaneous from paralysis of all the muscles of respiration, including the diaphragm.

If the fracture is below this level, the diaphragm still acts, as it is supplied by the phrenic nerve, which comes off the spinal cord high in the neck. The diaphragm is sufficient to maintain life without the aid of the intercostal muscles, and patients have lived for years with a fracture low down in the cervical region, but as a rule the lungs become congested, and hypostatic pneumonia occurs, the patient dying a few days after the injury.

If the injury is in the lumbar region no respiratory difficulty is to be feared.

First-aid treatment.—The patient should be gently turned so that he lies flat on his back, and a small pillow made of a rolled-up coat should be placed under his head.

He should be covered, if possible, till the means of carrying him are provided.

The best method of moving him is to carry him on a firm flat surface, such as a door or shutter.

One of these should be placed on the ground near him, and then he should be lifted by five people—one each side at the head, one each side of the pelvis, and one supporting his back. He should lie quite flat on the back, and be covered warmly, so as to counteract shock, but *no stimulant should be given* unless he is actually in danger of dying from shock, for it will tend to increase the hæmorrhage into the spinal cord.

Those who carry the patient should not walk in step. The bed in which he is to be nursed should be prepared before lifting him off the stretcher, and should be similar to the bed advised for fractures, with a fracture board beneath the wire mattress.

The patient should not be put upon a water-bed until he has been seen by the surgeon, who may order that he should at first be nursed without one, or he may give an anæsthetic to reduce any deformity that may be present, and put the patient into a plaster case.

If no orders are given to the contrary the patient should be nursed on a water-bed to prevent bed-sores, and the mattress and water-bed should both be covered with long mackintoshes, as incontinence of urine will be present. The bed should also have a draw mackintosh under the draw-sheet. The patient is lifted on to the bed in the same way as he was lifted on to the stretcher, and the clothes carefully removed. If there is any difficulty in removing any garment it should be cut away.

Care must be taken to keep the patient warm, hot-water bottles being placed in the bed, and no manipulation such as undressing should be attempted whilst the patient is in a condition of profound shock.

Care of the patient.—If the surgeon decides not to operate nor to enclose the patient in a plaster case, the whole treatment of fractured spine consists in careful nursing.

The patient should wear a single flannel garment fastening behind. The head should be supported on a small down pillow, but the ears must not be folded over or sores may develop behind them.

Long narrow pads or pieces of gamgee tissue should keep the arms from the sides, and the legs from one another, as pressure sores may develop at the places of contact. The feet should be held upright by a pillow, and a cradle should take the weight of the bed-clothes off them.

The bed must be kept clean and dry, and free from crumbs, and there should be no wrinkles in the bedding.

The usual routine for the prevention of bed-sores must be carried out at least three times a day, and also every time the bowels are opened.

When the draw-sheet is changed for incontinence of urine the patient can be either lifted or rolled, but whichever is done at least four people are required, one to lift or roll the shoulders, one to do the same for the pelvis and lower extremities, one to support the site of the fracture, and one to change the sheet.

Those supporting the shoulders and pelvis must move in unison.

At the first sign of a bed-sore the surgeon should be informed.

Urine.—In the case of male patients it is usually easy to fix a urinal so that the patient is kept dry, but in females urinals are not very satisfactory, and the most satisfactory method is to allow the urine to run into the bed, which is frequently changed, sometimes as often as once every two hours. The mackintoshes used should be frequently changed, and when the bed is made they can be sponged with 1 in 20 carbolic lotion so as to prevent decomposition of the urine.

Catheterization.—In some cases there is retention of urine, and the catheter must be used. It should be passed at regular intervals of six hours, and the strictest aseptic precautions must be carried out, as the slightest sepsis may lead directly to the patient's death.

A Jacques soft indiarubber catheter is the best variety for both male and female patients, and a No. 8 should be used. It can be sterilised by boiling.

In men the penis should be kept wrapped in cyanide gauze.

Result.—Three months after the accident firm union will have taken place in the majority of cases between the two parts of the spine; the union occurs by the formation of callus in a similar manner to union in other bones.

At the end of this time, therefore, the strict precautions necessary to prevent further damage in moving the patient can be given up, and the patient allowed to move himself as much as he can, and to sit up if this is possible.

The amount of resulting paralysis varies considerably. In some cases recovery may occur so far as to allow the patient to get up, walk about, and resume his occupation, whilst in other cases the patient remains bed-ridden and absolutely unable to move the lower extremities. While incontinence of urine and fæces persists the precautions as to bed-sores cannot be relaxed as can those of moving the patient, for as long as any paralysis or loss of sensation remains there is liability to this trouble.

Patients who have largely recovered, and are able to walk, frequently get pressure sores on the feet—the so-called perforating ulcers.

Laminectomy.—This operation consists of removal of part of the spinal column, and is undertaken for fractures of the spine, tuberculosis of the spine, and the removal of new growths. After the operation of laminectomy the patient must be nursed in the same way as for a fractured spine.

New growths and tuberculosis of the spine.—Patients suffering from these diseases may suffer from pressure on the spinal cord, causing paralysis and loss of sensation in the parts below the lesion as in fractured spine. This condition is spoken of as paraplegia.

The nursing of such cases will be the same as for fractured spine.

V.—CEREBRAL CASES

CEREBRAL CONCUSSION

Cerebral concussion is the name given to a train of symptoms which immediately follows a head injury. The symptoms are semi-consciousness, feeble pulse, shallow respiration, and a subnormal temperature. The musculature is relaxed, and if the condition lasts long enough there is either incontinence or retention of urine.

The **symptoms** may be transient or last for several hours. The first sign of recovery is usually vomiting. The patient then gradually becomes conscious, the pulse-rate rises, the respiration gets deeper, the patient complains of intense headache, and his senses are hyperacute. This is the stage of reaction.

In cases of severe concussion the reaction lasts for two or three days, and then the patient is well, or he may suffer from various cerebral symptoms, or rarely he may become insane.

Instead of the stage of reaction occurring the condition may pass into that of cerebral compression or cerebral irritation, with a corresponding change in the symptoms.

First-aid treatment.—A person who has received a severe blow on the head and is unconscious, with a weak fluttering pulse, should be kept lying flat on his back, and well covered to keep him warm.

Stimulants should not be given unless he is actually moribund.

Further treatment.—As soon as possible the patient should be got to bed and put between blankets with hot-water bottles, so that he is kept warm. If, while he is still unconscious, the surgeon orders a purge of calomel, the powder mixed with a little butter should be placed right at the back of the patient's tongue, so as to excite involuntary swallowing. Croton oil can be given in the same way with butter.

If necessary the bladder must be emptied with a catheter, and the urine should be saved for examination by the surgeon.

Feeding, if the condition is prolonged, is carried out by means of the nasal tube, the usual precautions being taken.



Photo: Fraternal Agency.

PLATE XLIV.—A WARD IN THE POPLAR HOSPITAL FOR ACCIDENTS.

Any scalp wound present should be treated in the same way as other accidental wounds.

If the patient is sick the vomit should be saved, as it is frequently important to test it from the medico-legal point of view.

Treatment of reaction.—The essential point in the treatment of the stage of reaction is bodily and mental rest. The patient should lie in bed in a dimly lighted room, and conversation, reading, and visits of friends should be forbidden.

The old plan of shaving the head and applying ice is rarely used now, but if it is ordered the application of the cold must be continuous.

The diet and purgatives will be ordered by the surgeon.

CEREBRAL IRRITATION

In some cases after concussion the patient exhibits a set of **symptoms** to which this name has been given. It is a state of extreme irritability of the mind in an apparently conscious patient, who is, however, in no way responsible for his actions. The bodily attitude is one of flexion of all the joints, and any attempt to make the patient lie extended is resisted with violence and swearing. Food may be taken if it be left near the patient, but it is useless to try and coax him to eat. Urine and fæces are frequently passed into the bed, but there is no true incontinence, and the patient may use a urine bottle if it be placed near him and left.

This irritable state slowly passes off and leaves the patient with very vague ideas of the time since the accident. Loss of memory of the events immediately preceding the injury is a frequent sequel.

Treatment.—The patient should be kept in bed and otherwise should be interfered with as little as possible. He should not be spoken to, nor should his friends be allowed to see him. Feeding may be one of the chief difficulties, but an attempt should be made to get the patient to feed himself by leaving food near him. The amount of food taken should be carefully estimated and reported to the surgeon, so that if necessary nasal or œsophageal feeding may be carried out.

The bed must be changed if urine and fæces are passed into it, but otherwise it should be touched as seldom as possible.

The patient must never be left alone, for at any moment he may attempt to get out of bed, or even to escape from the room, and sometimes, though rarely, he may attempt to injure either himself or the people taking care of him.

It is important to treat these patients as being entirely irresponsible in spite of their apparent consciousness, and the nurse must not be prejudiced against such a patient on account of violent and abusive language, for this may be altogether foreign to the normal mental state.

CEREBRAL COMPRESSION

This is a more serious condition than the mental states already described, as if the compression is not relieved death will follow. From the nurse's point of view there is little to be done for a patient with compression, but it is most important that she should be able to recognise the onset of the condition. When compression of the brain is due to rupture of vessels of the dura mater the symptoms may not appear for some hours after the injury, as bleeding takes place slowly. The patient frequently suffers from concussion due to the blow, and this may pass off and symptoms of compression appear later, or the first condition may insensibly merge into the second.

Symptoms.—The most characteristic symptoms are these: the patient is unconscious and cannot be roused by shouting; the breathing is slow, deep and noisy (stertorous); the pulse is slow and full; the temperature is raised, and may be different on the two sides of the body; and the pupils are generally unequal until the last stage, when they become widely dilated, and do not react to light.

Spasms of muscles and fits are not uncommon, and there may be either retention or incontinence of urine.

The nurse can do little for this condition, as the treatment consists in early trephining to relieve the pressure, but she should be aware of the symptoms, so that if they develop in a case of concussion she may at once inform the surgeon and save the waste of valuable time.

The patient must be kept lying flat, and should fits occur something soft must be placed between his teeth, to prevent biting of the tongue. The bladder must be attended to, and nasal feeding carried out if necessary.

Purgatives may be given in the same way as in cases of concussion.

TRAUMATIC DELIRIUM

Patients who have unstable nervous systems, either congenital or acquired, not unfrequently pass the border line between sanity and insanity, after an injury or a surgical operation. The loss of mental

control may be due to the shock of the operation, the effect of the anæsthetic or to subsequent poisoning with toxin if sepsis occurs, and it is usually temporary. The delirium in previously healthy patients is usually noisy and talkative, and the patient frequently tries to get out of bed, and that in spite of such accidents as a fractured femur or a severe internal injury. Delusions and hallucinations may be present, and the patient may attempt to get out of the room to escape from imaginary persecutors.

Later, and especially in septic cases, the patient gradually sinks into a condition resembling the final stages of typhoid fever, and this frequently results in death.

Treatment.—A patient with delirium should never be left alone under any circumstances, as it is impossible to tell when an attempt may be made to escape from the room, and delirious patients, especially of the noisy type, are often exceedingly cunning.

Bed-sores have to be carefully guarded against, as the constant movement and insensibility to pain of the patient make them difficult to avoid. Elderly patients, especially if septic, should always be nursed on a water-bed.

When the patient is so delirious that he cannot be restrained, and constantly tries to get out of bed or to remove his splints, his wrists and ankles should be fastened with shackles to the bed, but they should never be used without orders from the surgeon. Shackles are less likely to cause injury or to excite the patient than if two or three people are struggling with him to keep him in bed. The shackles should be carefully padded to prevent chafing.

If the patient refuses his medicine or food, and it is absolutely necessary to administer it, the nurse should get sufficient assistance thoroughly to overpower the patient, so that he may not be exhausted by a long struggle. The food or medicine can then be given through the nasal tube.

If the condition has followed a fracture the limb should be firmly fixed between well-padded splints, and slung in a cradle; it should not be fixed between sandbags. It must be remembered that these patients have often no perception of pain, and that a fractured femur will not prevent a delirious patient from trying to walk.

When the patient has passed into the typhoid state, the nursing consists of feeding and the prevention of bed-sores and œdema of the lungs.

Pulmonary œdema is prevented by turning the patient from side to side and propping him with pillows. The position should be changed every two hours.

DELIRIUM TREMENS

The two most common types of insanity due to alcohol are acute alcoholic mania and delirium tremens. The first variety is due to an excessive drinking bout, and the mania is often homicidal, whilst the second occurs in patients who have drunk to excess for years, and yet whose friends may truly say that they have never seen them drunk.

The attack is often determined by an accident, an operation, or an acute illness such as pneumonia.

Symptoms.—About forty-eight hours after an accident or an operation the patient becomes restless and suffers from general malaise. He is sleepless, has coarse tremors of the hands and tongue, and the temperature is frequently raised. In this stage the patient is sensible, and will answer questions; but if left alone, there is a tendency for the mind to wander, and he talks to himself.

Careful feeding, quiet, and a brisk purge may sometimes avert the attack, but if it progresses there are hallucinations, the patient imagining that he is surrounded by rats, mice, snakes, etc., or he may hold conversations with fancied enemies who he thinks are trying to injure him.

Later the condition may pass into one of low muttering delirium, and death not unfrequently follows.

Treatment.—What has already been said about the nursing of delirious patients applies to this special form of insanity equally, but the nurse must be especially careful to watch the patient closely, as it is impossible to tell when an attempt at escape may be made.

The author can recall one case where a patient jumped from a window and was killed, the nurse having only left the room for a minute or two.

VI.—MISCELLANEOUS ACCIDENTS AND EMERGENCIES

BURNS AND SCALDS

Burns and scalds are caused by the application of excessive dry and moist heat respectively, but the wounds caused by the strong corrosive acids and alkalis, such as sulphuric acid (vitriol) and caustic soda, are also called burns.

Electricity, again, may cause a burn, and recently it has been found that X-rays also can cause burns, which only appear some little time after the application of the rays.

In whatever way a burn is caused the effect is always the same; a certain amount of tissue—the amount varying with the intensity of the heat and the duration of its application—is killed, and has to be separated from the rest of the body as a slough before healing can occur.

If the burn only destroys the superficial part of the skin it is called a scorch, and the burn is of the **first degree**. The superficial layer of the skin quickly separates, and no scar results.

In burns of the **second degree** the epidermis is killed and becomes separated from the true skin by a layer of fluid (blister). The blister bursts, and the epidermis can be pulled off in long flakes. New epidermis quickly grows, and there is no scar.

Burns of the **third degree** always leave scars. The true skin is destroyed and becomes separated, leaving a raw surface underneath which can only heal by the formation of granulation tissue, and then fibrous tissue. In other words the wound heals by second intention, and much scarring results (*see* p. 19). All these degrees may be combined in the same burn.

At the time of the infliction of the burn the patient suffers from **shock**. This is most severe in young children and old people, and the larger the burn the greater the shock. Shock is also more severe with burns on the abdomen and chest than with burns of the extremities.

The chief cause of the great mortality following large burns is shock, and in the first-aid treatment everything possible must be done to counteract the severe collapse. The period of shock lasts for varying times, up to forty-eight hours.

As burns are not made on aseptic skin the wounds are always septic, and the burnt portion (slough) separates from the uninjured tissue by suppuration. During the separation the patient may suffer from septic absorption, and when the slough separates, large blood vessels may be opened, and lead to severe or fatal hæmorrhage.

After the sloughs have separated, the wounds heal by the formation of fibrous tissue, and this by its contraction leads to the occurrence of deformity.

In the treatment of burns, therefore, attention must be paid to the following points :—

1. Counteraction of shock.
2. Limitation of the sloughing by the use of antiseptics.
3. General treatment of the septic condition.
4. Rapid healing of the wounds.
5. Prevention of contraction.

First-aid treatment.—In *slight burns* the shock will be negligible, and all that is necessary is to dress the burnt surface as antiseptically as possible. Fragments of burnt clothes should be removed, and the burn exposed. For dressing, greasy preparations are the most grateful, and if they are antiseptic—such as boracic ointment—so much the better. If no antiseptic ointment is obtainable, vaseline, olive oil, or even butter (without salt) spread on lint make useful dressings. Flour, a very popular remedy, covers the burn, and keeps the air from it, and so soothes the pain, but it is messy and difficult to remove when opportunity occurs for the application of a better dressing.

Carron oil is linseed oil and lime water, and has no special virtues. A solution of bicarbonate of soda and water also makes a useful dressing. Ink is a remedy believed in by many of the poorer classes, but is useless.

In *severe burns* the general condition of shock is more important than the local burn, and every means should be taken to counteract it. The patient should be wrapped in a blanket, placed near a fire so that he is kept quite warm, and given hot drinks or brandy and water.

The surgeon will usually order opium to be given to relieve the pain, but the nurse should wait for instructions, and not give it on her own initiative.

If ordered by the surgeon the patient is immersed in a hot bath of boracic (10 drachms to a gallon), and he may be kept in this for hours. If the patient was wearing clothes at the time of the burn, this is a useful way to remove the burnt fragments, and the warmth counteracts the shock. It should not, however, be given by the nurse on her own responsibility.

Vomiting and diarrhœa are serious complications at this stage.

The *limitation of sloughing* and the *rapid healing* of the wounds is simply a question of antiseptic treatment and precautions.

Wounds caused by burns should be treated in exactly the same way and with as full antiseptic precautions as all other wounds, and healing will occur in the same way.

In the *dressing* of the *large raw surfaces* left by burns it is important

that the whole of the wound should not be uncovered at once. The dressing is usually an ointment or a lotion, and either should be applied on strips of lint, which should be removed and renewed one at a time.

The skin surrounding the burn should be kept quite clean. If an ointment is used there is a tendency for it to collect near the edge of the wound, and this and the pus and the serum which exudes should be carefully cleaned away each time the dressing is done.

The whole granulating surface should be covered with the ointment, so that the cotton-wool which is used in the dressing may not come in contact with it.

When healing is satisfactory the less often the dressing is changed the better, and instead of cotton-wool, aseptic gauze forms a useful dressing, as it readily absorbs the discharge.

The *prevention of deformity* does not come within the scope of the nurse's work, but the surgeon will order the application of a splint to prevent contraction, or may decide to skin-graft the granulating area.

Surgical scarlet fever.—There is little doubt that children suffering from burns are especially liable to contract scarlet fever. Rashes resembling the scarlet fever rash are, however, not uncommon in septic cases, and the occurrence of a red rash in a burn case does not necessarily mean the presence of the infectious fever.

The patient should, however, be immediately isolated until the opinion of the doctor in charge of the case is given.

This should be done if possible without alarming the friends.

ASPHYXIA

Asphyxia is caused by some condition which prevents the blood from being aerated in the lungs. The result is a lack of oxygen in all the tissues of the body, and death quickly ensues.

The **causes** may be (1) obstruction in the upper air passage, such as foreign bodies in the trachea, strangling and hanging, (2) want of oxygen as when carbonic acid gas is breathed, or in drowning, (3) consolidation of the lung as in broncho-pneumonia, (4) inability to expand the chest as in crushing, or (5) collapse of the lungs.

The **symptoms** are—increasing cyanosis with violent convulsive efforts to breathe. The **treatment** is the removal of the cause of the obstruction, and the supplying of oxygen.

Drowning.—This is the most common cause of asphyxia met with outside hospital work.

The time it takes to drown an adult is a little uncertain, but probably it is over four minutes of total immersion. The time is of little use in estimating the value of artificial respiration in any given case, for it is rare for total immersion to occur, and be continuous, and the nurse should always try to restore life unless the evidence of death is obvious.

Directly the patient has been removed from the water his chest and neck should be uncovered, and all the clothes loosened round the abdomen. The mouth is then opened, and the forefinger quickly removes any foreign body such as weeds, mud, etc. The patient is turned on to his face and with the mouth open is lifted so that the head hangs downward, and any water in the larynx and trachea can run out of the mouth. The mouth is again opened and the tongue drawn forward. Artificial respiration should then be started, according to one of the following methods :—

Sylvester's method.—The patient is placed on his back with the shoulders raised on his folded clothes, and the head extended. The nurse should stand behind the patient, and grasp his arms just above the elbow, and press them firmly against the chest wall. The arms are then raised slowly till they are fully extended above the patient's head, a fair amount of force being used, so that the muscles passing from the arms to the chest pull on the thoracic walls and distend them. The arms are then lowered and again firmly pressed against the chest wall. This extension of the arms expands the chest and causes inspiration, whilst pressure of the walls contracts it and causes expiration.

The movements should be repeated fifteen times a minute in an adult, and a little faster in children. The usual error is to execute the movements too rapidly. Directly natural breathing is established the artificial respiration should be stopped.

Schäfer's method.—In this method the patient is placed in the prone position, on his face, with the folded clothes just below the sternum, so that the abdomen is pressed upwards. The operator kneels across or beside the patient, and places his hands over the lower ribs. He next leans with the whole of his weight on the hands, so that the chest is compressed, imitating expiration, and then releases the chest, which springs back by its own elasticity into the normal position, imitating inspiration.

Laborde's method.—After the preliminary manipulations are finished

the tongue is seized and rhythmic traction made on it. The tongue is alternately pulled forwards in the mouth, and pushed back, the double set of movements occupying two seconds. This is a useful method of resuscitating the newly born infant.

Any method of artificial respiration should be supplemented by the administration of oxygen if the apparatus is at hand. After natural breathing is well established the patient should be wrapped in a warm blanket, and the usual treatment for shock carried out.

Secondary asphyxia.—It sometimes happens that when patients who have been resuscitated after apparent drowning are allowed to walk soon after recovery, the symptoms return. This condition is termed secondary asphyxia, and is prevented by keeping the patient recumbent for some hours after recovery. The treatment of the condition is artificial respiration.

Foreign bodies in the pharynx.—The most common foreign bodies which become impacted in the pharynx are pieces of meat, potatoes, or other foodstuff that are too large to pass. The patient rapidly becomes asphyxiated.

Treatment.—The mouth is opened, the forefinger thrust into it, and an attempt made to remove the obstructing mass. If this cannot be done the patient is rapidly everted, slapped on the back, and an attempt again made to remove it. Should this fail the only hope for the patient is a speedy tracheotomy.

EPILEPTIC FITS

A patient who has an epileptic fit suddenly becomes unconscious and falls to the ground, frequently injuring himself. The muscles then become tonically contracted, and cyanosis follows from cessation of the respiratory movements. This tonic contraction gives way to spasmodic jerking movements, and the patient grinds the teeth and foams at the mouth. Urine and fæces are frequently passed. This is followed by cessation of the movements, and the patient usually passes into a state of coma (post-epileptic coma), which may last from a few moments to hours. The fit itself rarely lasts longer than a minute, although the bystanders usually estimate it at much longer. In some cases fits follow one another in frequent succession, and such a condition is spoken of as the status epilepticus.

Treatment.—The patient sometimes gives warning of the fit by a cry, and a known epileptic may be saved from injury by promptly

catching him. The patient should be placed flat on his back on the ground, everything loosened round the neck, and something soft forced between the teeth, so that the tongue is not bitten. In hospital an india-rubber ring is generally used, but a soft handkerchief is nearly always available, and answers admirably.

Nothing further is necessary, but when the fit is over the patient can be put to bed till the coma passes off.

Hysterical fits may somewhat simulate epilepsy, but the patients rarely fall so as to injure themselves, the tongue is not bitten, and urine and fæces are not passed. The fit may last any time, and there is not the orderly sequence of epileptic fits, neither is consciousness lost.

Judicious neglect is usually the best treatment.

FAINTING FITS

If a person feels faint from obvious causes, such as fatigue, the sight of blood, etc., he should be sat down, and the head well depressed between the legs, and the sensation will then usually pass off.

If fainting occurs, the patient should be laid flat on the ground till he recovers.

When the patient cannot lie down for some time after the faint, a little alcoholic stimulant is excellent, but it should not be given if the fainting is due to loss of blood, or to an accident in which the extent of the injury is not known.

CONVULSIONS

Convulsions commonly occur in children, and may either indicate serious disease or be of trifling import. The symptoms are twitching of the face, spasms of the muscles, and cyanosis with rolling or fixed eyes, and may continue for hours or be transient.

Treatment.—If the convulsions are severe the child may be given a warm bath and sponged with hot water. He should not be left in the bath for more than ten minutes, even if the convulsions continue, but should be dried, wrapped in a blanket, and put to bed. The surgeon may order syrup of chloral, which may be given either by the rectum or the nasal tube, or he may administer chloroform if the convulsions continue.

COMMON POISONS, AND FIRST-AID TREATMENT

Opium.—This drug is usually taken as laudanum, or as an overdose of the many quieteners given to children.

The *symptoms* are delayed for a few minutes, and then after a brief period of excitement the patient becomes drowsy, the pulse and respiration slow, and the pupils of the eye contracted. The patient then becomes quite comatose and dies.

Treatment.—An emetic should be given at once, or if possible the stomach washed out. Hot strong coffee, sal-volatile, or other stimulant, should be given. The patient should also be kept awake by talking to him, making him walk, slapping his hands and feet, etc.

If, however, the patient cannot be roused he must not be dragged about in a comatose condition, otherwise the fatal end may be hastened.

In this as in all cases of poisoning, the medical man should be sent for as soon as possible.

Chloral.—The *symptoms* are drowsiness deepening into sleep, and coma. Death occurs from heart failure. The pupils are *not* contracted.

The *treatment* is the same as for opium poisoning.

Belladonna.—Poisoning from this drug occurs in children from eating the berries of the deadly nightshade, or from drinking liniment containing it.

The *symptoms* are vomiting, dryness of the mouth, and delirium. The pupils are widely dilated, a bright red rash may occur on the body, and the skin is dry.

Treatment.—If the drug has been swallowed the stomach must be emptied by an emetic, or the stomach tube. Stimulants such as coffee, brandy, or sal-volatile, should be administered.

Aconite.—The root of this plant may be mistaken for horse-radish, and it is a common constituent of liniments.

The *symptoms* are tingling and numbness in the mouth and throat, nausea, vomiting, and a burning sensation in the stomach. Death occurs from failure of the respiration.

The *treatment* is the same as for belladonna poisoning.

Strychnia.—This is present in many vermin killers, and is sometimes eaten by accident.

The characteristic *symptoms* are spasms of the muscles, so severe that the patient is jerked about. In the intervals between the spasms the muscles are relaxed, which is an important diagnostic point from tetanus. The jaws are clenched, and the tongue may be bitten.

Treatment.—The only thing possible is to give an emetic or to wash out the stomach, both very difficult to do, on account of the convulsions.

Prussic acid.—This drug is usually so rapidly fatal that nothing can be done, but, if possible, an emetic should be administered, and artificial respiration started.

Carbolic acid.—This may be swallowed by accident, or with the purpose of committing suicide, or may be absorbed when used for surgical dressings and lotions.

The *symptoms* are those of shock (p. 45), and appear quickly after the poison is swallowed. There is a burning pain in the stomach, but vomiting is not a constant feature as in other kinds of irritant poisoning. The mucous membranes of the mouth and throat become white. The smell of the breath is also diagnostic.

Treatment.—Emetics may be given, but often they will fail to act. A soft stomach tube passed with great care may be used to wash out the stomach. Olive oil should be freely given, and stimulants may be administered.

Corrosive acids.—*Oxalic acid* (used for cleaning purposes), *sulphuric acid* (vitriol), *nitric acid*, *hydrochloric acid* (spirits of salt) are all corrosive poisons, and the *symptoms* of all are shock, burning pain in the throat and stomach, and vomiting which may be blood stained.

The vomit in sulphuric acid poisoning is usually black, and in nitric acid, yellow.

Treatment.—No emetic is necessary, as the patient is vomiting, and the stomach tube must never be used. Shock must be counteracted in the usual way.

Give magnesia, chalk, soda, or plaster from the ceiling, so as to neutralise the acid; olive oil may also be given.

Corrosive alkalis.—These are *caustic potash*, *caustic soda*, and *ammonia*. The *symptoms* are similar to those of the corrosive acids, but the vomit is ropy.

Treatment.—No emetics are necessary, and the stomach tube must not be used.

The antidotes are vinegar and lemon juice, given in olive oil.

CHAPTER XXIII

SURGICAL AND ACCIDENT NURSING (*concluded*)

BY RUSSELL HOWARD, M.S.(LOND.), F.R.C.S.

HOW TO PREPARE FOR AN OPERATION: Preparation of the Patient—Preparation of the Patient for Special Operations—Preparation of the Room—The Patient's Requirements—The Surgeon's—The Anæsthetist's—The Nurse's—Arrangements for Washing—Anæsthetics—Preparation of the Nurse's Hands—Gloves—Care of Sponges. AFTER THE OPERATION: Asphyxia—Shock—Hæmorrhage—Abdominal Operations (1) in Adults, (2) in Children—Emergency Abdominal Operations—Colostomy Cases—Operations on the Stomach—Nose and Throat Operations—Hare-lip and Cleft Palate Operations—Operations on the Bladder, on the Kidney, on the Head, on the Rectum—Ear Cases—Operations on the Nose and Naso-pharynx—New Growths. TRACHEOTOMY AND INTUBATION: Tracheotomy Tubes—Diphtheria—Antitoxin Injection—Preparing for the Operation—Care of the Tube—How to Replace it—Intubation of the Larynx. BANDAGING: The Materials Used—Different Types of Bandages—Bandages for Various Parts of the Body.

VII.—HOW TO PREPARE FOR AN OPERATION

WHEN a nurse takes charge of a patient who has to be operated upon in a private house she has two principal things to consider, (A) the preparation of the patient, and (B) the room in which the operation is to take place. If the patient is not to be nursed in the operating room, the bedroom also has to be prepared.

A.—PREPARATION OF THE PATIENT

This will vary with the operation to be performed, and the following is the routine method of preparing a patient who is not to undergo an emergency operation, and for whom no *special* preparation is necessary. The preparation may be considered under two heads—general and local.

General preparation of the patient.—(a) *Rest*.—It is a good thing to keep the patient quiet for a day or two before the operation, and

if possible he should be in bed for the last twenty-four hours, but this is not necessary in many small operations. The advantage of rest is that the anæsthetic is as a rule taken better if the patient has remained in bed for a day or two before it is administered.

(b) *Diet*.—The food for the two days should be light and nutritious, but no irksome restraint should be placed upon the patient's appetite, as a well-fed patient is better able to stand the shock of an operation than a semi-starved one.

The stomach should be empty at the time of the operation, as vomiting is then less likely to occur, and the anæsthetic is taken better. For morning operations the last meal should be a light supper, and for mid-day operations a light nutritious breakfast, but a cup of beef tea or milk may be given four hours before the operation is started.

Young children and very elderly people should never be completely starved for more than four hours, and infants should only miss the feed before the operation.

(c) *Purgatives*.—The intestine should be as empty as possible, so as to avoid flatulence. If fæces are present in the lower bowel they are frequently passed during the operation, or if not, their early passage after the operation may be disturbing to the patient.

To secure an empty bowel a purgative is given twenty-four hours before, and a plain soap-and-water enema should be administered four hours before the operation. Care should be taken that the aperient does not keep the patient awake during the night. A drachm of castor oil is a suitable aperient for children.

If the operation is to be done as an emergency, the customary enema should be omitted, as it increases shock, and in many cases it will be retained, to be passed on the operating table. It is obvious that in cases of acute intestinal obstruction the usual aperient and enema should be omitted. If a case of chronic obstruction is to be operated upon the nurse should always ask if an aperient and enema are to be given, as the administration of an aperient may turn a chronic obstruction into the acute variety, with serious consequences to the patient.

(d) *Bladder*.—The bladder should be emptied naturally, just before the operation. The use of the catheter is contra-indicated, unless the patient has urine in the bladder and is unable to pass it.

(e) *Clothing*.—A flannel nightgown for women, and flannel pyjamas for men, with woollen socks are convenient, but the patient's usual night

clothing is generally all that is necessary. Extra warmth can be secured for old people and children, and for collapsed patients, by wrapping their chests and limbs in gamgee tissue.

During the operation the nightdress should be covered with mackintoshes, and tucked well out of the way so that it may not get soiled.

Local preparation of the patient.—This preparation aims at rendering the site of the operation as aseptic as possible.

Twenty-four hours before the operation the patient should be given a bath, or be thoroughly washed in bed. The site of the operation is then washed with warm water and soap, plenty of both being used, and special care being taken of any folds of the skin, such as the umbilicus, the folds of the groin, or under the breasts. The swabs used in washing should be frequently changed. If the part be at all hairy it should first be shaved, and when possible and desirable, this should be done by a barber, as unless done skilfully, it may be very painful. This particularly applies to the scalp. If the pubic region of a female patient has to be shaved, some surgeons prefer that it should always be done after the patient is anæsthetised. For the legs and arms a nail-brush may be used, but not for more tender parts, as it may cause excoriation. If the part is very dirty turpentine may be used to clean it. A large area of skin should always be prepared.

After the skin has been thoroughly cleaned with soap and water it should be lightly rubbed with ether to remove all the fat, and then sponged over with a solution of biniodide of mercury and spirit, 1 in 500. All excess of this solution must be removed, or it may cause blistering of the skin.

Compress.—Surgeons differ in the use of the antiseptic compress, some always using it, and some having it renewed two or three times, whilst others have given up its use entirely. If a compress is employed it should be made of sterilised lint wrung out in 1 in 40 carbolic lotion, or in 1 in 1,000 perchloride or biniodide of mercury, or any other antiseptic solution the surgeon orders. The compress should cover a large area of the skin. A piece of gutta-percha tissue should be placed over the lint, and the whole kept in place by a bandage.

If no compress is used the area of skin that has been cleaned should be covered with a piece of sterilised lint, or a sterilised towel.

In emergency operations, especially when the abdomen is to be opened, it is better not to prepare the skin of the patient until he is under

the anæsthetic. These patients are usually suffering from shock, and the exposure of the abdomen and the necessary manipulation of sponging and cleaning increase this condition.

When the patient is under anæsthesia the sponging and cleaning can be quickly done, and the operation at once started.

Final preparations.—The hair of a female patient should be done in two plaits, and if the operation is to take place on the face or neck it should be covered with a mackintosh cap. The patient should be asked if she has any false teeth, and if so they should be removed and placed in a glass of clean water.

Before the anæsthetic is started the various swabs and lotions to be used in cleaning the skin again should be quite ready. A bowl of lotion for the surgeon, and one for his assistant should also be prepared. The usual lotions are carbolic 1 in 40 to 1 in 80, biniodide of mercury 1 in 1,000, perchloride of mercury 1 in 1,000, lysol 3i to Oi.

PREPARATION OF THE PATIENT FOR SPECIAL OPERATIONS

1. **Excision of the tongue, upper jaw, and other mouth operations.**

—These operations are most frequently performed for cancer, and there is usually an ulcer in the mouth which is in a very septic condition.

Preparation of the mouth.—The mouth must be rendered as aseptic as possible. For three days before the operation it should be washed out with a mild antiseptic lotion, such as carbolic acid 1 in 80, every three hours, and after each meal. The patient must, of course, be allowed to have a good night's rest.

The teeth should be cleaned with a soft tooth-brush and carbolic tooth-powder, whilst the ulcer itself must be cleaned with pieces of lint held on forceps and dipped in 1 in 1,000 perchloride of mercury lotion.

This cleaning should be repeated about an hour before the operation, and it should be explained to the patient that similar manipulations will have to be carried out after the operation, so that he may be prepared for them. The method of feeding after the operation should also be explained. The face and neck should be cleaned and shaved in the usual way, the ears also should be cleaned.

2. Operations on the stomach.—The mouth should be rendered as aseptic as possible by cleaning the teeth with some mild antiseptic lotion. For two or three days before the operation it is advisable to boil all the food taken so that it is sterile.

The last meal is given twelve hours before the operation, and one hour before the operation a large nutrient enema is given.

3. **Rectal cases.**—There are two ways of preparing a patient for a rectal operation.

(1) A brisk purgative is given two nights before the operation, and repeated the night before, so that the whole alimentary canal is well emptied. Two large soap and water enemata are also given, one about nine hours, and the other about three hours before the operation. It may be necessary to give a third enema, and after the last has acted, the anus and buttocks should be well washed. If the patient is suffering from hæmorrhoids and they prolapse after the last enema they should not be returned.

(2) The alimentary canal is cleared in the same way by purges and enemata, but the last enema is given twenty-four hours before the operation, and the bowels are allowed to rest. Small doses of opium may be given during the last twenty-four hours, so as to stop the peristalsis of the bowel.

The second method is to be preferred in most cases, as it ensures that the rectum is quite empty, whilst in the first method it is not uncommon to find a large quantity of mucus, and the remains of the last enema in the rectum.

A T-bandage (p. 88) should be provided for the operation, and fastened round the waist before the anæsthetic is given.

4. **Bladder operations.**—In some operations on the bladder such as cystoscopy, the surgeon may prefer that the urine should not be passed before the operation, and various kinds of water such as Contrexéville are given for an hour or two before the examination, so that the bladder shall contain plenty of urine. The patient in these cases should be warned not to pass urine, even if the retention causes a little pain.

5. **Ophthalmic cases.**—The night before the operation is to take place the face and head should be thoroughly washed, special care being given to the eyelid. The eyelashes, if long, should be cut short, and when the hair has dried it should be brushed, and in female patients arranged on the top of the head. Just before the operation, the face should be again washed with the same precautions, and then bathed with boracic lotion, and dried with a sterilised towel. The eye to be operated upon is then covered with a sterile pad, unless the operation is to take place under cocaine anæsthesia.

To render the eye thoroughly anæsthetic with cocaine a few drops of a freshly prepared, sterile, 2 per cent. solution of the hydrochlorate of cocaine should be placed in both eyes a quarter of an hour before the operation, and repeated at frequent intervals in the diseased eye, until the operation is commenced.

Application of drops to the eye.—The best apparatus is a small thin glass bottle provided with a very narrow neck. This is half filled with the lotion to be used, and when inverted and grasped the heat of the hand is sufficient to expel the contents. Another method is to apply the drops by means of a camel's hair brush dipped in the lotion. The patient should be seated with the head slightly inclined backwards, and the nurse should gently separate the upper and lower lid with the thumb and forefinger of the left hand, and then apply the drops to the outer angle of the eye.

Ointment can also be applied with a camel's hair brush, a small piece of the ointment being placed at the outer angle.

B.—PREPARATION OF THE ROOM

The **choice of the room** will not always be left to the nurse, but it must be well lighted, preferably naturally, by a large window, and it should not be small. The room should be prepared by taking up the carpet, and after the boards are scrubbed covering them with a clean sheet. Pictures and hangings should be taken down, and only necessary furniture retained in the room. If the room is overlooked white muslin curtains should be stretched across the lower part of the window, or the windows covered with whiting.

The room should contain a fireplace or some means of keeping it warm— 75° F. if possible. There should be a small gas or methylated spirit stove, so that any instruments can be quickly sterilised during the operation.

It is advisable to have some source of artificial light in case the natural light fails, as may happen in a fog or a 'thunderstorm.

At least four people will be present at the operation, the patient, the surgeon, the anæsthetist, and the nurse, and preparation must be made for each.

1. **The patient.**—It is an advantage that the patient should be nursed in another room to that in which the operation is to take place, but should it be necessary to nurse him in the operating room the bed

should be made ready, and then pushed into one corner of the room. The bed should be a single one with a chain mattress on which a horse-hair mattress is placed, and when nursing the patient it must be placed in such a position that it can be approached from both sides.

A small pillow is all that is needed immediately after the operation, and the bed should be made up with clean blankets and sheets, and one side of the clothes should be turned up so that the patient can be readily placed in it and quickly covered. Of course the nurse is often dependent upon the bed placed at her disposal, and should not insist on having one of the most ideal kind, but it is impossible to nurse a patient well on a feather bed.

The operating table is sometimes provided by the surgeon, but one can as a rule be easily improvised. It must be long enough for the patient to lie down at full length, and narrow enough for the surgeon and his assistant, who usually stands on the opposite side of the table, both to reach the patient readily. It must not be so low that the surgeon has to stoop much. A kitchen table is often convenient, or two small tables of the same height firmly joined together, or a leaf from a table supported on trestles. For children, especially for operations on the head and neck, a chest of drawers can be used. If the table is low a horse-hair mattress can be placed on it, and it should be covered with a clean blanket and a mackintosh, the latter being warmed just before the operation.

The table should be placed with the foot towards the light, and it should stand out in the centre of the room so that it can be readily approached from all sides, but it must be in a good light.

A small firm pillow should be placed at the head of the table, and if the operation is to be on the head or neck, this should also be covered with a mackintosh.

2. The **surgeon** will require two tables, one for his instruments, and one for lotions, dressings, swabs, towels, etc., and for certain operations, such as rectal, vaginal and bladder operations, a firm strong chair. The tables should be cleaned (scrubbed, if possible), and covered with a clean cloth or towel.

3. The **anæsthetist** requires a table and a chair, and his apparatus should never be mixed with that of the surgeon. The table should be placed at the head of the operating table on the right hand side. On it the anæsthetist's apparatus should be placed, and also the various

stimulants used for counteracting shock and resuscitating the patient if heart failure occur under anæsthesia.

If the nurse has to prepare the anæsthetist's table the following things should be put out:—

(a) *Inhalers*.—Clover's ether apparatus, Rendle's mask and sponge, Skinner's mask, and Junker's apparatus, if the case be one of operation on the nose or mouth.

(b) *Anæsthetics*.—Chloroform, ether, A.C.E. (alcohol, chloroform, ether) mixture.

(c) *Instruments*.—Mason's gag, tongue forceps, dental prop, swab-holders, and hypodermic syringe—these should be sterilised.

(d) *Stimulants*.—Brandy, strychnia, caffeine. A dram of brandy should be placed in a hypodermic syringe, and an injection of $\frac{1}{30}$ and $\frac{1}{60}$ strychnia should be got ready.

(e) A *bowl* to catch vomit.

Nitrous oxide gas and ethyl chloride are now largely used as a preliminary to other forms of anæsthesia, and these and the apparatus for administering them should be ready in hospitals and nursing homes.

It is convenient to have a stethoscope on the anæsthetist's table.

In operations in private houses the anæsthetist brings his own apparatus.

4. The **nurse** should have a table to herself if possible, on which she should place her bowls and lotions, especially if she has to keep sponges clean.

Arrangements for washing.—All water used at an operation should be sterilised by boiling.

The nurse should have as large a supply of freshly boiled water as she conveniently can. After the water has been boiled it is set aside in clean (if possible, sterilised) jugs to cool. The jugs should be covered so that no dust can get into them. A constant supply of very hot water should be arranged for, so that if it is wanted no delay may take place in obtaining it. The nurse must also provide soap and a supply of clean towels.

A second room, preferably one with a lavatory, such as the bath-room, and on the same floor as the operating room, is convenient. In it the surgeon can change his coat for his operating clothes, and wash his hands without disturbing the operating room.

In the operating room itself there should be a washstand with

two basins, a soap dish and soap, and two new sterilised nail brushes in a bowl of antiseptic lotion.

Basins.—If possible all the basins and dishes used at an operation should be sterilised by boiling, and the large copper found in many houses can be utilised as a steriliser. If this is not possible the basins should be thoroughly washed clean, and then rinsed out with boiling water.

Pails should be provided for holding dirty swabs and water.

This somewhat elaborate preparation should be carried out in all important operation cases, but, of course, must be suitably modified for less important surgical procedures. For example, little preparation would be needed if the patient were going to have the tonsils or a small sebaceous cyst removed, and common sense would suggest how the room should be prepared. At the same time, for even the most trivial operation strict asepsis is absolutely essential.

In cases where the operation is done as an emergency, and the nurse has only a few hours or minutes to prepare a room, it is important that it should not be disturbed too much, otherwise dust will be flying about at the time of the operation, and settle on the wound and instruments and dressings.

The carpet should be covered with slightly damp sheets, and heavy dusty pieces of furniture may be covered in the same way.

The furniture should be wiped with a cloth damp with 1 in 40 carbolic lotion, and it should only be moved sufficiently to make a space for the operating table and the other necessary things.

Anæsthetic.—The anæsthetic will nearly always be given in the operating room in private houses and nursing homes, whilst in hospital it is usually given in a separate room. The nurse should see that the patient is warmly clad in passing from room to room, and she should prevent the patient as far as possible from seeing the preparations for the operation.

When in the room the patient should be quickly placed lying flat on the operating table, covered with a warm blanket, and all clothing should be loosened round the neck.

During the actual administration of the anæsthetic *no* preparation of any kind should be done until the anæsthetist gives permission. The nurse may hold the patient's hand at the beginning of the administration, but should the patient begin to struggle the arms should be held above

the elbow and the legs above the knees. The patient is more readily controlled if held here, and is less likely to do himself injury.

Directly the anæsthetist gives permission the area to be operated upon should be quickly exposed, mackintoshes arranged in position, and the bandage of the compress cut and removed. The compress should not be touched until the surgeon requests it. All these things should be done quickly, as time is now an important object.

Preparation of the nurse's hands.—If the nurse is to have anything to do with the wound she must render her hands as sterile as possible, and keep them so by touching nothing that is not sterile, and in any case she should clean her hands thoroughly and keep them as sterile as possible consistently with her duties. If she is not able to keep them sterile, and she is asked by the surgeon to do something in connection with the wound, she should *not* comply until she has pointed out to him that her hands are not clean. Before washing, the nails should be cut quite short; and then the hands washed in hot water, plenty of soap being used. The water should be changed several times, and special attention should be given to the nails and the clefts between the fingers. The arms should be thoroughly washed as high as the elbows. The hands and arms should then be rinsed in a 1 in 500 solution of biniodide of mercury and spirit, a sterile nail brush being lightly used, and finally rinsed in a weak antiseptic solution and left wet.

Gloves.—If indiarubber gloves are worn the hands must be as carefully washed as if they were not used, but before putting on the gloves the hands should be rinsed in a little soap solution, which will make them slip on easily. If the gloved hands touch anything that is not sterile they should be washed in soap and water and dipped in biniodide solution.

A glove with a hole in it is much more dangerous than the naked hand, and if a glove becomes torn or pricked during the course of an operation it must be at once discarded, and the hand thoroughly washed again.

Care of sponges.—One of the principal duties of a nurse at an abdominal operation is to look after the sponges. A definite number of sterile sponges—the number should be written down—should be placed in a weak warm antiseptic solution before the operation starts, and the nurse should have a second bowl filled with lotion in which to wash them. When a sponge is asked for it should be rapidly wrung dry and handed to the surgeon. A sponge soiled with blood is taken from the surgeon, rapidly cleaned in one of the basins, and then transferred to the second

ready for use. Dirty and clean sponges should never be mixed, and the lotions in the bowls should be frequently changed. Of course the nurse cleaning the sponges will not be able to do this, as she must remain sterile.

Beside cleaning the sponges the nurse must carefully watch what the surgeon does with them, so that at any time during the operation she may know where each sponge is. Sponges that have been dropped on the floor or soiled with pus or fæcal matter should be at once discarded. If more sponges have to be used, the number must be carefully remembered, and if the surgeon cuts one in two it must be noted, and added to the number of sponges used. At the end of the operation the nurse *must* know if all the sponges have been returned, and must be able to account for every one of them.

VIII.—AFTER THE OPERATION

Directly the operation is finished the patient should be put back into bed and covered with a warm blanket over which the bed-clothes are placed. The head should be placed on a low pillow or quite flat, and turned to the side on which it is most convenient for the nurse to be. The patient must not be left until consciousness is quite recovered as he may choke from getting vomited matter in his larynx, or, being restless, may disturb the bandages or start hæmorrhage.

Asphyxia.—With an unconscious patient the danger of vomiting is that he will suddenly inspire and inhale vomited matter into his trachea, and rapidly become asphyxiated.

Asphyxia may also occur from the tongue falling backwards into the throat and covering over the opening into the larynx, or—after an operation on the mouth—from blood running into the air passages. The symptoms are noisy breathing and blueness.

When a patient is inclined to vomit the head should be turned over to the side, and a towel or receiver placed under the mouth. The jaw should be pushed forwards by the thumb placed behind the angle of the jaw, and if this is not sufficient to relieve the breathing the mouth must be opened, and the tongue pulled forwards either by grasping it with a piece of lint or linen or with the tongue forceps. There may be some difficulty in opening the mouth owing to the clinching of the teeth, and if the proper gag is not at hand the mouth must be forced open with a spatula or a piece of wood. With the mouth well open and the tongue pulled forwards the breathing should become easy, but the larynx

may still be obstructed by a foreign body. The forefinger should search the back of the throat, and if a foreign body, such as a piece of food or a false-tooth plate, is discovered, it should be removed. Beyond this the nurse can do nothing to relieve the obstruction, but should the respiration cease artificial respiration should be carried out till the arrival of the surgeon.

Shock.—Shock is a condition of general depression of the vital processes which if carried to excess ends in death. It occurs after any severe injury or operation, or the shock may be of mental origin, but in all cases the symptoms and treatment are the same. The symptoms are—a subnormal temperature, feeble irregular pulse, shallow respiration, a pale greyish colour of the face, which is bathed in a cold clammy sweat. The pupils as a rule are dilated.

Shock is treated by rest, warmth, and the administration of fluids and stimulants.

1. *Rest.*—The patient should be kept as quiet as possible, and restlessness combated by gentle restraint. In some cases morphia will be given, especially if the restlessness is caused by pain, but if it has to be given it must be ordered by the surgeon.

2. *Warmth.*—The patient is wrapped in a hot blanket, and hot-water bottles are placed in the bed, care being taken that they do not rest against the semi-conscious patient and so burn him. The bed must not be made so hot as to cause profuse sweating, as this will induce the condition of shock.

If the patient can swallow, and it is allowed by the surgeon, warm milk may be given by the mouth, but this is not usually permissible after operation, especially on the abdomen. The room in which the patient is nursed should be kept at an even temperature of 67° F.

3. *Fluids.*—Fluid can be given by itself or combined with stimulants. The most suitable fluid is normal saline solution, *i.e.* water containing a drachm of common salt to a pint, and it is most suitably administered by the rectum. A pint of saline fluid is warmed to a temperature of 100° F., and run into the rectum by means of a tube and funnel. The fluid is run in slowly, otherwise it will act as an enema and be returned. This injection may be repeated if necessary, and if the surgeon orders a stimulant—such as brandy—it may be mixed with the saline injection.

Fluid may also be given by *continuous subcutaneous infusion*. The

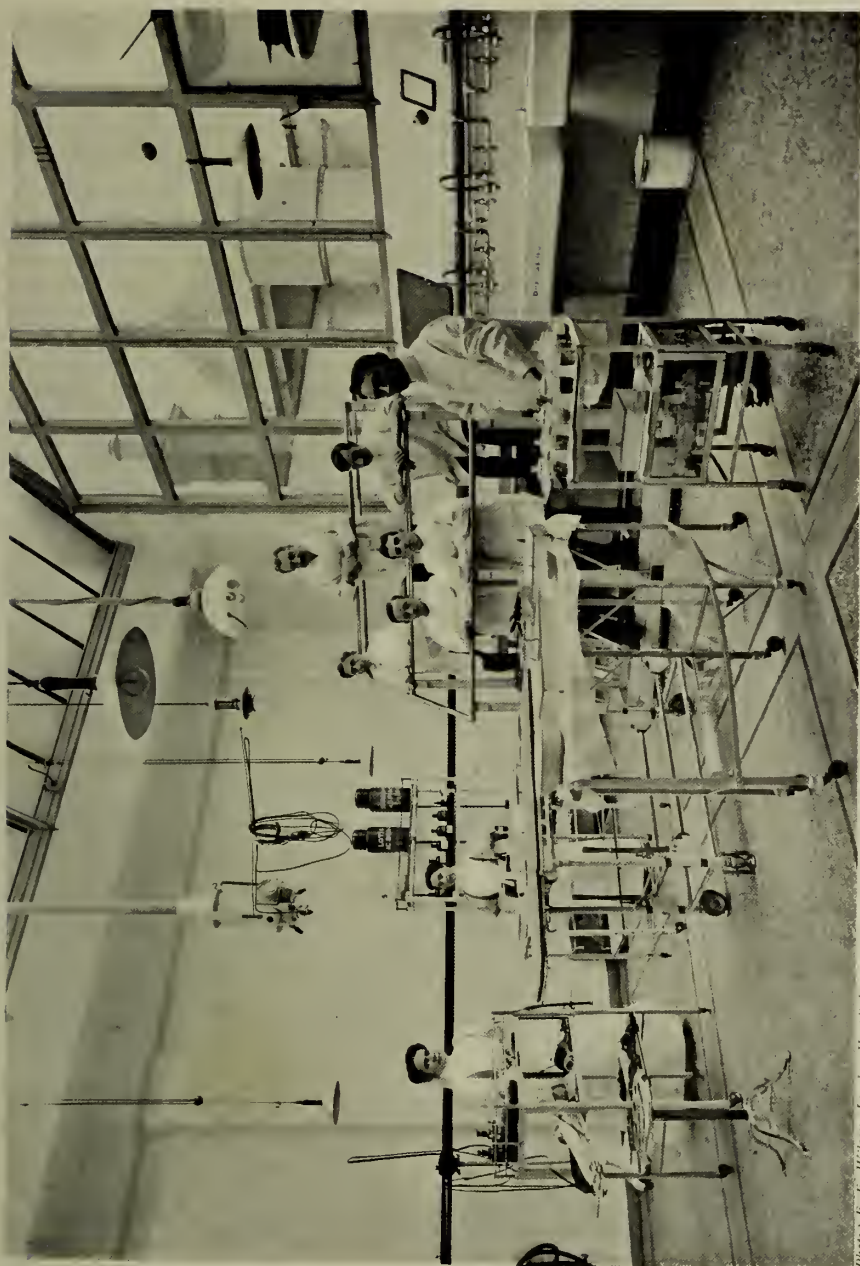


Photo: E. E. Wilson, London Hospital.

PLATE XLV.—OPERATING THEATRE, LONDON HOSPITAL.

part usually chosen for the injection is the loose tissue on the inner side of the thighs, and the fluid is run in by syphonage. This infusion may be kept up with intervals for hours or days, and many pints of fluid may be used.

The nurse will have to see that the water is maintained at a temperature of 110° F. by adding fresh hot water from time to time, and that the flow does not take place too quickly. The rate of flow should be about a pint an hour, and it may be regulated by clips placed on the infusion tubes. Too rapid flow shows itself by swelling round the needles, and if this appears the tube should be clipped, and the swelling may disperse under gentle massage.

If the flow stops it usually means that the needles are blocked, and the surgeon should be at once informed. The infusion should cause no pain or discomfort, and restlessness and blueness indicate that something is wrong. The flow should be at once checked, and the doctor informed.

Intravenous infusion, or the injection of fluid directly into a vein, is another way of giving fluid, and is frequently used during or after operations. It will always be done by the surgeon, and the nurse has only to get the apparatus ready. This consists of a sterilised cannula and two-way syringe with tubes, and six pints of normal saline fluid at a temperature of 115° F. The following instruments also should be sterilised: scalpel, scissors, dissecting forceps, aneurysm needle, silk ligatures, and a bandage.

This small operation should always be done with full antiseptic precautions.

Hæmorrhage.—The nurse should examine the bandage from time to time to see if blood is soaking through it, and if it is she should report to the surgeon. At the same time she should cover the dressing with a layer of sterile cotton-wool. If the case is an operation involving one of the cavities of the body, such as the peritoneum or the pleura, the nurse should watch carefully for the symptoms of concealed hæmorrhage (p. 2), and should she suspect this dangerous complication she should at once report to the surgeon.

AFTER-TREATMENT OF SPECIAL OPERATIONS

ABDOMINAL OPERATIONS

Posture.—As a general rule the patient should be nursed in the dorsal position with the knees supported over a pillow, and with a support for the lumbar spine. This position is convenient for feeding

and nursing, but it should not be too rigidly enforced, and if the surgeon gives permission the patient can be moved on to the side, and propped there on pillows, but he should not be allowed to move himself.

If there is pus in the general peritoneal cavity, the surgeon may order the head of the bed to be raised on blocks, and in cases of operation on the stomach it may be necessary to nurse the patient in the semi-sitting position. This position must also be adopted in patients suffering from heart and lung diseases.

Sponging.—If the condition of shock has passed off, the bed should be remade about twelve hours after the operation, and the patient's arms and legs sponged with warm water. If the nightdress has been soiled at the operation this opportunity should be taken of changing it.

Thirst.—This will be one of the most distressing symptoms after abdominal operations, and may be relieved in the following ways:—

1. Hot or cold water may be given by the mouth an ounce at a time as soon as the vomiting has ceased, and this quantity may be repeated as often as the patient desires, within reason, unless vomiting occurs.

2. Saline fluid may be injected into the rectum, a pint being slowly administered.

3. The mouth must be kept clean and moist, and one of the following washes may be used:—

- (a) Carbolic acid solution 1 in 80.

- (b) Lemon juice and borax and glycerine—an equal quantity of each.

- (c) Lemon juice and soda water.

It is not good to give ice as a routine, but it may be useful in checking vomiting. Weak tea or coffee may be given about twelve hours after the operation if there is no vomiting.

Aperient.—The surgeon will order the aperient and state when it is to be given, so that the nurse has no responsibility in the matter, but before the bowels are open the patient may suffer severely from flatulence. The passage of a long rectal tube may give some relief, but if this symptom is severe the surgeon should be informed, as flatulence alone may be sufficient to cause the death of the patient.

Hiccough, if it occur, may be relieved by sipping water, by giving a drop of cajeput oil, or by the application of a mustard leaf to the epigastrium.

Diet.—Many surgeons have their own methods of feeding after an

abdominal operation, but if no special orders are given, the following is a useful routine:—

About twelve hours after the operation if there is no marked vomiting the patient is given an ounce of milk with an ounce of lime water. The milk may be peptonised, but this may make it distasteful to the patient. If no vomiting occurs “feeds” may be given every hour, increasing steadily both the quantity and the relative proportions of milk and water. On the second day after the operation the patient should be taking three pints of milk in the twenty-four hours. Some surgeons dislike milk on account of its tendency to cause flatulence, and may order albumen water or plasmon.

1. *Albumen water*.—This is made by beating up the whites of three eggs in a pint of water, and adding lemon and sugar to taste. Two ounces should be given every two hours whilst the patient is awake, two pints being given in the twenty-four hours for the first two or three days.

2. *Plasmon*.—This is albumen prepared from milk. Three teaspoonfuls of plasmon are gradually added to half a pint of tepid water, and the whole boiled for two minutes. Lemon can be added as a flavour, and the liquid given either hot or cold. Two ounces should be given every two hours, for the first two days. Later it can be combined with other forms of diet.

After the bowels have been opened the diet may be increased. On the third day jelly, milk jelly, custard puddings, and lightly boiled eggs may be given. About the fifth day the patient may have pounded fish, well boiled potatoes, raw meat sandwiches, and soft puddings. Ordinary diet may be resumed about the tenth day, but care should be taken not to over-feed.

The patient is usually confined to bed for three weeks, and then should be got up gradually. At first he should be placed on a couch, then allowed in a chair, and gradually permitted to walk a little, the time out of bed each day being slowly increased. In about a week from getting up the patient should be getting about comfortably.

ABDOMINAL OPERATIONS IN CHILDREN

Posture.—If the child cannot receive the undivided attention of the nurse he should be fixed in the dorsal position. The shoulders should be secured by means of straps, a fracture cloth being passed across the abdomen and secured on each side of the child by sandbags. The

legs should be fastened to the bottom of the cot by means of a linen bandage, secured round each ankle.

The blanket should be secured across the child just below the axillæ, so that the arms are left free.

If the nurse has only one child to look after there is no objection to her nursing it in her arms if she can get it to sleep in this way.

Thirst is treated as in adults, only smaller quantities of fluid are given.

Diet.—The feeding follows the same lines as in adults, but in smaller quantities. The child should be taking two ounces of milk and one of lime water every two hours, sixteen hours after the operation.

If the child is not an infant light food should be given on the third day.

Aperient.—As in adults, the time and method of getting the bowels to act will be ordered by the surgeon, but in the absence of special orders an enema may be given at the end of twenty-four hours, and then the child considered convalescent as far as aperients are concerned.

EMERGENCY ABDOMINAL OPERATIONS

Giving of fluid.—Fluid, preferably hot water, should be given in small quantities (3j to 3j) directly the patient has recovered from the anæsthetic, and the nurse should not wait until the patient complains of thirst. So long as profuse vomiting does not occur fluid should be given freely, as the tissues are in urgent need of water.

Vomiting.—This is one of the serious difficulties after some emergency abdominal operations, and the surgeon will order the means to combat it. Ice and iced champagne are useful in some cases, and various drugs may be given.

Diet.—The method of feeding largely depends on the amount of vomiting. If this is slight the feeding should be carried out upon the same lines as other abdominal operations, but the patient should be encouraged to take food.

In some cases all food is rejected by the stomach, and it will be necessary to feed by the rectum with nutrient enemata. These are prescribed by the surgeon. No aperient must be given until the surgeon gives permission.

COLOSTOMY CASES

The operation of colostomy is the making of a permanent artificial anus into the colon.

The colostomy opening is usually situated in the left iliac region, and it is either made at the time of the operation or two days later.

The bowels usually act directly after the colostomy wound is opened, but if they do not, an ounce of olive oil or two drachms of glycerine injected into the bowel will usually secure a motion.

The patient should be cleaned directly the motions are passed, and then re-dressed, and this rule sometimes necessitates many dressings during the day. The skin round the colostomy is apt to become sore from the irritation of the discharge, and it should be kept covered with a thick layer of hazeline or other ointment. Careful dressing will prevent this soreness, and its presence usually means neglect.

When the patient is ready to get up, a colostomy belt will be ordered by the surgeon.

OPERATIONS ON THE STOMACH

After operations on the stomach such as **gastro-jejunostomy**, large nutrient enemata (3x) should be given every eight hours, starting twelve hours after the operation, and continuing from two to three days. A rectal wash should be given every twenty-four hours.

Milk and lime water are given twenty-four hours after the operation, starting with half an ounce of each. This fluid should be boiled to make it sterile. The milk and water should be given every half-hour at first, but the quantity and the interval should be slowly increased so that at the end of forty-eight hours the patient is having five ounces of milk every two hours.

The rest of the feeding is as for other abdominal cases.

If vomiting occurs the patient should be propped up in the sitting position (if the surgeon allows it) and given small quantities of ice to suck. The early vomit will probably contain blood, but this need cause no alarm.

Gastrostomy.—If the operation has been that of gastrostomy there will be a permanent opening into the stomach through which the patient must be fed.

The feeding should be similar to that given by the mouth for other abdominal operations, but rather larger quantities should be given at a time, and the feeds should be boiled to render them sterile. After the patient has got over the anæsthetic vomiting, he should have ten to fifteen ounces of milk and two eggs at each feed, and the feeding should be repeated every four hours.

It must be remembered that the patient has a recent wound, and the feeding must be carried out with full aseptic precautions, to prevent contamination of the wound.

Regurgitation of the gastric juice may occur through the opening, and if it does so the skin of the abdomen will become red and sore. To prevent this a simple ointment is spread round the wound. Bicarbonate of soda, by neutralising the hydrochloric acid, will help to keep the skin sound.

When the wound is firmly healed any food that will pass down the tube should be given, and if the patient is able to swallow naturally, as much food as possible should be administered by the mouth.

NOSE AND THROAT OPERATIONS

Posture.—After extensive operations on the tongue, the floor of the mouth or the jaws, the patient should be placed in bed lying on the less injured side, and this position should be maintained until he is quite conscious, and shock has passed off.

The further nursing can be done with the patient propped up into the sitting position, or the position on the side may be maintained. In the case of feeble elderly patients the lateral position is perhaps the better, but if the patient has borne the operation well, the sitting position is the more comfortable, and the patient is more readily attended to in this attitude.

Hæmorrhage.—There is usually some little oozing from the wound immediately after the operation, and with the patient lying on the side the blood and mucus collects in the cheek. It can readily be removed by gentle swabbing. If the bleeding is more profuse the patient should be kept on the side, and the surgeon sent for at once. The hæmorrhage can sometimes be stopped by firmly pressing a swab against the bleeding point, and this should be done whilst waiting for the surgeon's arrival.

Care of the mouth.—Wounds in the mouth want as careful aseptic treatment as wounds in other parts of the body, a fact that is too frequently forgotten. All instruments, swabs and dressings, should be sterilised, and the nurse's hands carefully cleaned.

The wound in the mouth must be kept clean by swabbing, syringing or sponging, with some weak non-poisonous antiseptic. Immediately after the operation the wound will want constant attention, but as the

oozing of blood and serum lessens it should be thoroughly cleaned every two hours, and after each feed. The cleaning must not be overdone so that the patient is being constantly worried, and he must have intervals for sleep.

If the surgeon has plugged a cavity in the mouth with gauze, it should not be disturbed until orders are given to remove it.

Feeding.—The food at first should be fluid, and may be given in either of the following ways :—

1. If the patient can swallow, milk or albumen water is given from a feeder, to which is attached an indiarubber tube, so that it passes far back into the throat. The patient can learn to feed himself in this way.

2. *Pharyngeal feeding.*—A tube to which a glass funnel is attached is passed into the œsophagus from the mouth, and the fluid poured down.

3. *Nasal feeding.*—An indiarubber tube is attached to a small glass funnel, and the whole is sterilised by boiling.

The tube is passed along the nose into the pharynx, and thence into the œsophagus, about twelve inches of tubing being passed. The milk is then slowly poured down the funnel. If the tube passes into the larynx instead of the œsophagus, cough will be excited, and the tube should at once be removed.

4. *Rectal feeding.*—Some surgeons prefer this for the first few days, so that the wound may not be interfered with, and risk of sepsis be avoided. After shock the great danger to be feared in these cases is the onset of septic broncho-pneumonia, owing to septic particles being inhaled into the lungs from the wound in the mouth.

This is avoided by nursing the patient in the sitting position, or lying on the side, and by keeping the mouth scrupulously clean.

HARE-LIP OPERATIONS

These operations are almost invariably done in infants, and the child must as far as possible be prevented from crying. If practicable the nurse should nurse the child in her arms when it is awake, to keep it quiet.

For the first few hours after the operation the child may be nursed with the face downwards, so that any blood or mucus may readily run out of the mouth.

The feeding is best done with a spoon, especially if the case is com-

plicated, as it often is, by a cleft palate. The child is placed on the nurse's lap, lying on its back with the head slightly extended, the spoon is put well into the mouth and the milk poured directly into the pharynx; it is then swallowed by the involuntary action of the pharyngeal muscles.

The lip and mouth must be kept quite clean, the mouth being wiped out after each feed, and the nurse must take care that the child does not disturb the dressing with its hands.

In some cases after a hare-lip operation the child breathes badly, owing to the nasal respiration being obstructed. If this is the case the mouth should be opened, and the lower jaw a little depressed by the nurse's finger till the child breathes easily again.

CLEFT PALATE OPERATIONS

These may be done either in an infant, a young child, or an adult.

If in an infant the after-treatment is the same as for hare-lip, and the two operations may be combined.

The roof of the mouth should be little interfered with, but to keep it clean the hard palate may be brushed over with a camel's hair brush dipped in boracic lotion. The opportunity of the child's crying should be seized to do this.

In young children—if the patient is docile and does not object—the palate can be gently syringed with boracic lotion two or three times a day, and after each feed. If the child objects very much to the syringing it should not be done.

The child should be kept quiet and forbidden to talk. In adults the same cleaning of the palate should be done, and the teeth should be kept cleaned with a piece of lint on a holder.

The patient is forbidden to talk, and a slate should be provided on which he can write down his wants. He may be allowed to sit up, but must be warned against laughing, coughing, or sneezing.

As a rule absorbable stitches are used for these operations, so that there will be no necessity to remove them.

OPERATIONS ON THE BLADDER

The bladder is usually opened from above the pubis, and after the operation the urine runs through the opening thus made instead of passing through the natural passage.

The art of nursing these cases is to keep the patient as dry as possible



PLATE XLVI.—OPERATING THEATRE, LIVERPOOL ROYAL
INFIRMARY.

by frequently changing the dressing, and constant attention should be given to the prevention of bed-sores. The bed should have a long mackintosh under the sheet, as well as a draw mackintosh, and the latter should be changed every time the patient is dressed. The wound must be re-dressed every twelve hours at first, and very large dressings should be used to absorb the urine, and each time the dressing is done the patient should be washed, and the back rubbed and powdered. It is an advantage to put a thick layer of ointment round the wound to prevent irritation of the skin.

As the wound heals the dressing should be done more frequently, but at the end of the second week the urine should commence to pass along the urethra, and less frequent dressings are needed.

A special form of dressing, known as Colt's suprapubic dressing, is now being used for cystotomy cases, which does away with the need for such frequent changes. While the wound is healing the patient should take as little fluid as is consistent with comfort, so that the secretion of urine may be less than usual.

WASHING OUT THE BLADDER

It will usually fall to the nurse to wash out the bladder of female patients who are suffering from severe cystitis, and she must look upon it as an operation, and take full aseptic precautions.

The apparatus required is a soft rubber catheter about No. 8, to which a small funnel is attached. The catheter is passed into the bladder and a mild antiseptic fluid allowed to run through it by pouring it into the funnel, which is then elevated. The lotion should always be warm, and the amount allowed in the bladder at one time should be judged by the sensation of the patient, who will feel it filling, but no more than five ounces should ever be used at once. When this quantity is in the bladder the funnel should be lowered, and the fluid will run out. The washing should be continued until the return flow is quite clear. The external genitals should be dried after the catheter is withdrawn.

OPERATIONS ON THE KIDNEY

The after-treatment of operations on the kidney follows the same rules as after other abdominal operations, but the patient should be encouraged to drink plenty of bland fluids so that there may be a copious secretion of urine.

The first urine passed will usually contain blood, and should be saved for inspection by the surgeon.

OPERATIONS ON THE HEAD

No special immediate after-treatment is necessary after cerebral operations. Rest and quiet are absolutely essential, and the nurse should see that the patient gets them. Alcohol and all stimulants are to be avoided.

OPERATIONS ON THE RECTUM

Diet.—A light diet consisting of boiled fish, milk puddings, tea and toast should be given until the bowels are open, and then ordinary diet may be resumed.

Dressing.—If the nurse has to dress the case, the gauze dressing should be changed on the second day, and a fresh dressing applied after the skin round the anus has been carefully cleaned. The dressing should be done once in twenty-four hours until the bowels are open, and then twice a day, and always directly after the bowels have acted.

Fistula cases should have a bath once a day after the bowels are opened, and the wound should be at once dressed. It is important that the gauze should be carefully laid into all the fistulous tracks, otherwise relapse is certain. It is most convenient to dress these cases in the lateral position.

Piles.—After an operation for piles long ligatures will frequently be left hanging out of the anus. These must on no account be interfered with or pulled upon, otherwise severe hæmorrhage may result, but if they do not separate by the tenth day the surgeon should be informed.

Purgative.—A purgative will usually be ordered to be given on the third night after the operation, and, if necessary, it will be followed in the morning by a saline aperient. Directly after the motion is passed the wound must be cleaned. If a tube has been left in the anus after the operation, it should be removed before the motion is passed.

The patient should be kept lying down in bed for at least fourteen days after the operation.

Retention of urine.—One of the frequent sequæ of rectal operations is temporary retention of urine. So long as the patient does not complain of pain no notice need be taken if the urine is not passed in twenty-four hours. After that time sponging of the genitals or hot fomentations applied to the perineum may give relief. Patients who cannot micturate

whilst lying in the dorsal position will often do so if allowed to turn on the side, and this should be tried.

If retention continues, the surgeon will probably order the passing of a catheter, but if the pain is severe the nurse should take upon herself the responsibility of passing the instrument, otherwise over-distension of the bladder will occur, and may be followed by permanent paralysis.

Passage of a catheter in a female.—The catheter used should be sterilised by boiling, and the most convenient kind is either a soft indiarubber No. 8 or a glass catheter. The vulva should be washed with soap and water, and then sponged with a dilute antiseptic. The part should be exposed in a good light, the labia majora separated with the thumb and forefinger of the left hand, and the catheter passed directly into the meatus without touching the labia. After all the urine has been withdrawn the catheter is removed, and the parts dried.

Failure of asepsis may result in inflammation of the bladder.

EAR CASES

The most frequent operation performed on the ear by the general surgeon is mastoidectomy, or opening up of the mastoid antrum and cells of the middle ear.

Diet.—Unless the patient is very sick a light diet may be given the morning after the operation, and an ordinary diet on the following day. The patient is usually allowed up on the fourth day after the operation.

Dressing.—The wound is dressed for the first time on the fourth day after the operation. The gauze is removed, the cavity cleaned by syringing, and then the gauze replaced. This dressing is repeated every second day for about three weeks, and then the gauze is omitted, and the cavity syringed with boracic lotion twice a day until healed.

To syringe out an ear.—The patient should be seated in a good light, and the nurse should stand on the side of the ear to be cleaned, and slightly behind the patient. The syringe should be completely filled with warm lotion, for if air is left in, it will make a noise as it is expelled, which is startling to the patient.

The upper part of the pinna of the ear is grasped between the thumb and forefinger of the left hand, and pulled gently upwards and backwards, so as to straighten out the auditory canal. The nozzle of the syringe is introduced just inside the meatus, and the stream of lotion directed forwards and inwards along the roof so that it returns along the floor.

The force at first should be slight, but steadily increased as the patient gets accustomed to it.

The returning lotion should be caught in a receiver held by the patient under the ear. A towel should be placed round the patient's neck so as to protect the collar and dress.

After the ear has been thoroughly syringed, ear and auditory canal are carefully dried with a little cotton wool, and then a little powdered boracic acid is insufflated into the ear. In some cases of aural disease, when the ear is being syringed, the patient will complain of the fluid running into the throat. The fluid reaches the naso-pharynx by means of the Eustachian tube, which runs from the middle ear to the back of the nose.

OPERATIONS ON THE NOSE AND NASO-PHARYNX

The special nursing to be done in these cases is to keep the parts thoroughly clean.

If no directions are given, the nose should be kept clean by means of warm boracic or an alkaline lotion, introduced with a spray producer.

The best form of instrument is one with a single ball so that the spray may be stopped at once if the patient chokes. This form of instrument is also most convenient for applying cocaine or adrenalin to the mucous membrane of the nose.

Nasal douche.—This is not so much used as formerly, as there is danger of driving fluid into the accessory sinuses of the nose.

The apparatus consists of a douche tin to which is fitted an india-rubber tube ending in a nozzle. The nozzle is placed in the nostril, and the douche tin elevated so that a stream of water passes up the nose. If the patient breathes quietly through the mouth the stream will return down the other nostril, and can be caught in a receiver. Syringing the nose is attended by the same danger of infecting the accessory sinuses as the nasal douche, but if very little force is used it is quite safe. A simple way of applying a lotion to the nose is to sniff it up from the palm of the hand, or it may be poured in from a specially shaped flask with the head held backwards. All lotions applied to the nose should be used warm.

NEW GROWTHS

There are two great classes of new growths or tumours, innocent and malignant.

An **innocent new growth** grows slowly, pushes aside, but does not infiltrate, surrounding structures, is quite local, and only causes symptoms or death by its position. For example, an innocent fibrous tumour growing under the skin may weigh several pounds, and yet may only be an inconvenience, whilst a small one growing inside the skull may cause fatal pressure on the brain.

The *treatment* is removal, and when this is done completely the tumours do not recur.

Malignant tumours grow rapidly, infiltrate surrounding structures, and destroy them, cause secondary tumours to appear in glands and other parts of the body, and cause death by destruction of vital organs, by ulceration and hæmorrhage, and by exhaustion.

The subjects of malignant tumours sooner or later waste, and become anæmic, a condition known as cachexia. These tumours are known to the laity as cancers, and are justly dreaded.

In the majority of cases the only treatment is an extensive operation removing all the tumour and a large amount of the surrounding tissue, but only too frequently the growth recurs and ends fatally.

In some cases X-ray treatment is valuable, and various other remedies may be tried, but they are not usually attended with success.

The nursing of cases of malignant growths means the nursing of the various operations which are undertaken for their removal, but there are several general rules which the nurse should observe.

The term tumour is nearly always associated in the lay mind with malignant growths, and therefore the nurse should avoid using the term unless the patient has been told the nature of his illness by the surgeon. Cancer is more alarming still, and is frequently incorrect, and the nurse should seldom or never use this word when speaking in the presence of the patient or his friends.

The prognosis of malignant growths is decidedly bad, but the nurse should never by word or manner suggest this. A fair number of cases are cured by operation, and it is cruel to damp the hopes of the patient or his friends by hinting anything but a favourable result from an operation which they are probably already dreading. Even when the operation is unsuccessful and the growth has recurred, the nurse should keep cheerful and optimistic. In a few cases spontaneous cure of malignant tumours has occurred, and although this is very rare and quite inexplicable, yet patients may always hope for it.

Recurrence is often very insidious, and may be present long before the patient realises it, and the nurse should never be the first to suggest it to him unless it is the only means of getting him to see a surgeon.

Although the nurse can do nothing to check the onward march of a malignant tumour, yet by attending to the patient's comfort in many



Fig. 74.—SILVER TRACHEOTOMY TUBE IN POSITION.

little ways and by a cheerful and kindly demeanour she may rob a fatal illness of many of its terrors.

IX.—TRACHEOTOMY AND INTUBATION

TRACHEOTOMY

Tracheotomy is the operation of opening the trachea. The opening made is usually kept patent for a longer or shorter time by the introduction of a tracheotomy tube.

Tracheotomy tubes.— There are many different varieties of

tracheotomy tubes, and the nurse should always make herself thoroughly conversant with the particular variety which is being used in the case she is nursing. For the most part they are made of silver, and consist of an outer tube which fits into the trachea, and an inner tube which fits snugly inside the outer.

The outer tube should never be removed without the surgeon's orders, except in cases of great emergency, whilst the inner tube is frequently removed so that it can be cleaned.

The outer tube is kept in position by tapes fastened round the neck, whilst the inner tube is fastened by means of a small catch.

Most tubes are supplied with a handle or pilot which exactly fits the outer tube, and with which it is inserted into the trachea. Morratt Baker's tubes are made of indiarubber, and there is only one tube. They are not inserted at the time of the operation, but only after a silver tube has been worn for some time.

Reasons for tracheotomy.—Tracheotomy is performed because there is some blockage of the upper air passages, or to remove a foreign body from the trachea or bronchus. The most important causes for this operation are—

Laryngitis—either specific or non-specific.

Malignant growths of the larynx.

Œdema of the glottis.

Foreign bodies in the larynx and pharynx.

Scalds of the larynx.

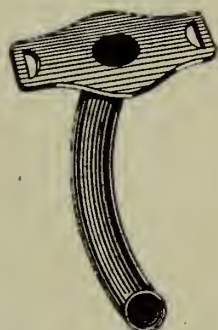


Fig. 75. — MORRATT
BAKER'S TRACHEO-
TOMY TUBE.

Diphtheria is a specific form of laryngitis, due to infection by the Klebs-Löffler bacillus. Besides the mucous membranes of the larynx, the tonsils, pharynx, nose and other parts may be infected. Locally the infection causes the formation of a false membrane on the mucous membrane, whilst generally or constitutionally the patient is poisoned by the toxins produced by the growth of the bacilli.

The false membrane consists of fibrin, cells and bacilli, and when it is pulled off it leaves a slightly bleeding inflamed surface, over which the membrane rapidly grows again. The opening of the larynx (glottis) in a child being very small, the formation of the false membrane blocks it completely, and air can no longer enter the trachea or lungs.

An opening is therefore made into the trachea so that air can enter until the disease is cured and the false membrane disappears.

At the same time it must be fully understood that the tracheotomy does not cure the disease, it only relieves the most urgent symptoms, and in spite of a successful operation the patient may succumb to the general infection.

Another way in which the disease may prove fatal is by extension of the inflammation and formation of false membrane below the tracheotomy wound, and blockage of the trachea or bronchi.

As the nursing of a case of tracheotomy for diphtheria is the most difficult of all tracheotomy cases, it will be described here in detail.

It is not necessary to perform tracheotomy in all cases of diphtheria, and the nurse may be left in charge of a case in which it is doubtful whether the operation will be necessary. The decision will depend upon the relief given to the symptoms by medical treatment, and the nurse should immediately report any increase of the following symptoms to the surgeon :—

1. Difficulty in breathing.
2. Cyanosis.
3. Restlessness.
4. Retraction of the lower ribs at each inspiration.

The general treatment of diphtheria at the present time consists of giving an antitoxin, and the nurse may be required to make the injection or at least prepare the patient for it.

Antitoxin injection.—In giving an antitoxin it is of the utmost importance that everything used should be sterile, otherwise a second infection may be grafted on to the first. The hands of the nurse and the skin of the patient must be cleaned as for other operations, and the syringe used must be sterilised by boiling.

The site of the injection is the loose skin of the groin, and if a second injection is necessary it should be given on the opposite side of the body to the first.

Special care should be taken that the whole of the dose is given, and the injection should be made slowly, the swelling being gently rubbed to diffuse the fluid through the subcutaneous tissue. The small puncture made can be closed by a collodion dressing.

Preparation for tracheotomy.—The following instruments should be sterilised :—

Tracheotomy tubes, three sizes, pilots and tapes.

Tracheal dilator.

Tracheal hooks.

Spencer Wells' forceps (four pairs).

Scalpel.

Scissors.

Needles, sutures, and ligatures.

Dissecting forceps.

Button-hook retractors.

The usual swabs, dressing and lotions for any operation should be got ready, but there is no need to clean the patient, and a compress should not be applied. The cleaning will be done when the patient is under the anæsthetic, should one be given.

If the nurse is the chief assistant she will have to hold retractors and to sponge. In holding the retractors she should be careful not to pull on them too much, and in swabbing she must not interfere with the movements of the surgeon. It has been said that the chief difficulty of tracheotomy is "an over-officious assistant."

After the operation is over the child will usually sleep comfortably for a time, and the nurse is then able to arrange the necessary details of after-treatment. The following must always be at hand, viz. tracheal dilators, dressing forceps, the pilot of the tube, feathers, pieces of lint as swabs, solution of carbonate of soda.

Care of the tube.—The tube is put in position in the trachea, and a double fold of gauze should cover its opening.

Each time the patient has a spasm of coughing, mucus and pieces of membrane are coughed through the tube, and the nurse should promptly wipe them away before they are sucked back again. A piece of membrane in the mouth of the tube can often be removed with forceps.

After a time the tube will become filled with dry mucus and membrane so that the air way is blocked. The inner tube should be removed, leaving the outer tube in position. The inner tube is cleaned with alkaline lotion, and put back into position, and this is repeated as frequently as necessary. Even if the tube does not get blocked it should be removed and cleaned every two hours.

If after removal of the inner tube the air way is not free it means that membrane is blocking the outer tube. A feather moistened in

warm bicarbonate solution should be passed down the outer tube, turned round and withdrawn. Mucus is wiped away in this manner, and the spasm of coughing caused will often result in a piece of membrane being coughed up. The feathers should always be inspected before use, so as to be certain that they are not broken, as a piece of feather left in the trachea may cause serious trouble. They should be used as seldom as possible, and some surgeons go so far as to forbid their use entirely.

To replace the tube.—If the outer tube is coughed out or pulled out by the patient it must be at once replaced. The child is held on the lap, wrapped in a blanket, and the trachea opened with the dilator held in the right hand. It is then passed into the left, and the tube on the pilot held in the right. The tube is next passed between the blades of the dilator into the trachea, and the pilot at once removed. The dilator is now removed, care being taken that the tube is not pulled out again at the same time.

In cases where the tube has been in for some time the opening into the trachea becomes patent, and the tube can be readily replaced without using the dilator.

Urgent dyspnoea which is not relieved by the passage of a feather must be met by prompt measures. The surgeon should at once be informed, but before his arrival it may be necessary to remove the outer tube in order to save the patient's life. The patient, if a child, should be controlled by wrapping it in a small blanket, and should be laid flat with the head slightly extended. The tracheal dilator is held in the right hand, the tube is slipped out with the left, and the dilator is at once inserted into the trachea and opened.

The chief difficulties in this manipulation are hurry on the part of the nurse, and a tendency to open the dilator before it is well into the trachea. The trachea is kept dilated till the surgeon's arrival, or if a large piece of membrane is coughed up and the child breathes easily, the tube may be replaced. If the child stops breathing the trachea should be kept open with the dilator and artificial respiration started.

Removal of the tube.—The tube is always removed by the surgeon, who alone will decide when this should be done. Directly it has been removed it should be sterilised, cleaned and fitted on to its pilot, so that it can be quickly put in again if the necessity arises. It is impossible to say whether it will be necessary to replace the tube, and sometimes it has

to be done promptly to save the patient's life. The indication for replacing it is return of the difficulty in breathing.

Diet.—The diet of a case of diphtheria is similar to that given in any other infectious disease. It should be liquid, and the quantity suited to the age of the child. As in all severe acute illnesses, there is a distaste for food, and a dislike to the exertion of taking it, so that the child must be coaxed to eat, otherwise it will die of inanition. If liquid food cannot be swallowed, or it is returned through the nose, it may be thickened with arrowroot to make it a semi-solid, and it will then frequently be taken without difficulty.

If the semi-solid food cannot be swallowed, the child must be fed through the nasal tube.

Antitoxin rashes.—These rashes are of various forms, but are usually bright red in colour, and irritating. They appear usually about ten days after the injection of antitoxin, and do not demand special treatment. The nurse should be prepared for them and report their presence to the surgeon.

Heart failure.—This is one of the constant dangers of diphtheria, and should be guarded against by allowing no exertion of any kind on the part of the patient. Even sitting up in bed should not be permitted until the surgeon orders it, no matter how well the patient may feel.

Continual watchfulness and tact are necessary to keep a child who feels well quiet and recumbent.

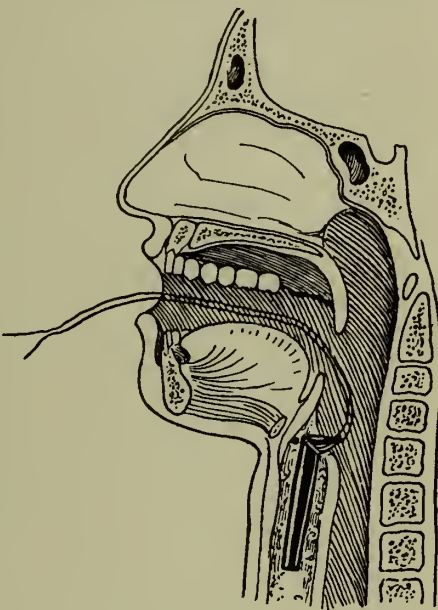


Fig. 76.—INTUBATION OF LARYNX: THE TUBE IN POSITION.

INTUBATION OF THE LARYNX

Intubation of the larynx is a measure that in some cases takes the place of tracheotomy. It is employed when there is a temporary obstruction in the larynx, as in diphtheria, and has the great advantage

over tracheotomy that there is no wound, and consequently no resulting scar. The operation consists in placing a suitably shaped tube in the larynx between the vocal cords so that a free air way is established.

The tubes are made of various sizes, so as to fit any larynx, and are supplied with a special mouth gag, an introducer, and forceps for removal. These should all be sterilised by boiling before the operation. The introduction of the tube is carried out without anæsthesia, and

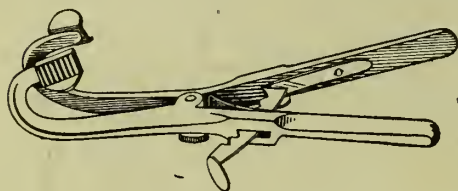


Fig. 77.—MOUTH GAG.

the child should be lying in bed wrapped in a blanket, with the head slightly extended over a small sand bag, placed under the neck. The nurse will usually either have to hold the head perfectly steady in the median line or to control the movements of

the patient's body and legs. A silk thread is attached to the tube, and after the tube has been introduced it is looped over the ear and fastened by a piece of strapping.

Care of the tube.—One of the dangers of the silk thread is that the child may be irritated by it and pull the tube out of the larynx. To prevent the patient from doing this a good plan is to encase the arms from the wrists to the axillæ in tubes made of cardboard, and lined with cotton-wool. These will prevent the elbows from being bent, and so the child cannot reach his mouth and interfere with the tube, but at the same time he can play with books and toys.

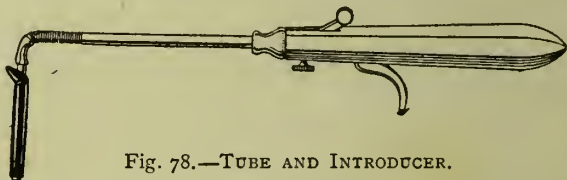


Fig. 78.—TUBE AND INTRODUCER.

It may be necessary for the nurse to remove the tube if it becomes blocked by mucus or membrane, the occurrence of which will be shown by the increasing difficulty the patient has in breathing. The tube must only be removed if the patient is in danger of dying.

Removal of the tube.—If the silk thread has been left attached to the tube it is pulled upon and the tube at once comes out of the mouth. It should be cleaned so that it is ready for the surgeon to replace on his arrival.

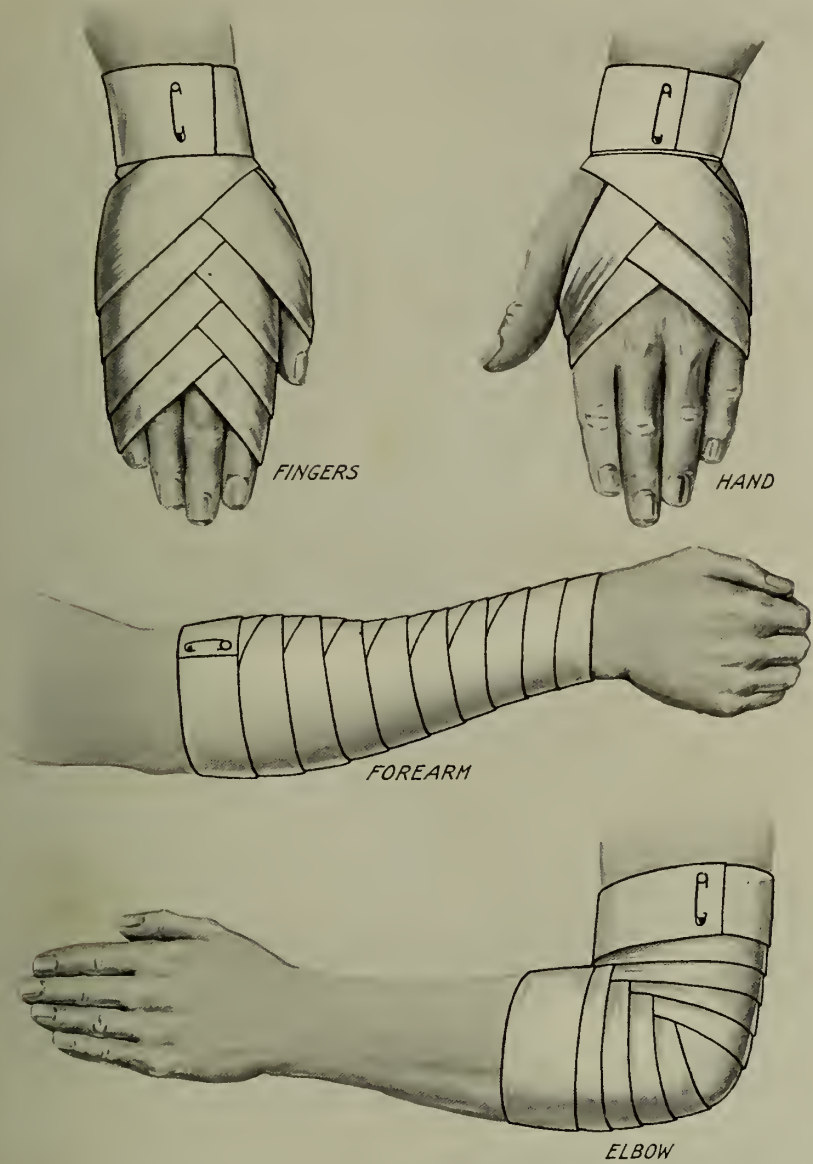


PLATE XLVII.—BANDAGES FOR THE FINGERS, HAND, FOREARM, AND ELBOW.

If there is no thread the tube is removed in the following way. Wrap the child in a blanket, and place it on its side near the edge of the bed. Place the thumb below the level of the cricoid cartilage (*i.e.* the lower end of the tube) and move it upwards, so that it carries the tube with it. The special forceps for removal of the tube are too dangerous for a nurse to use.

If the tube is removed by accident or design the surgeon should at once be informed, and if the patient stops breathing before his arrival artificial respiration should be carried out.

The danger of the tube being coughed up, and there being no one of sufficient skill to replace it, constitutes one of the reasons why intubation has not superseded tracheotomy. The latter operation may have to be performed if intubation is unsuccessful.

Diet.—The food and the method of giving it are similar to those mentioned for tracheotomy, and the same complications may occur.

After the tube has been removed the child may experience some difficulty in swallowing for a day or two, and nasal feeding may have to be resumed.

X.—BANDAGING

Bandages may be used for the following purposes, *viz.* : (1) to retain a dressing in position ; (2) to exert pressure on a swollen limb or to prevent swelling ; (3) to keep a part warm ; (4) to immobilise a joint or a fracture ; (5) as a dressing.

For the first purpose the commonly used bandages are made of linen, calico or cotton, and they should be sterilised by dry heat before use. A bandage that has not been soiled with pus, vomit, or faecal matter may be washed, re-sterilised, and used again, but for aseptic operations a new sterilised bandage should always be provided. To exert pressure an elastic bandage is necessary, and it may be made of elastic webbing, crêpe, stockinette or indiarubber. The last-mentioned is very popular under the name of Martin's bandage.

For warmth, flannel bandages are often useful, and they are frequently worn round the loins and abdomen, or used for bandaging joints affected with chronic rheumatism. If it is desired to immobilise a joint, the

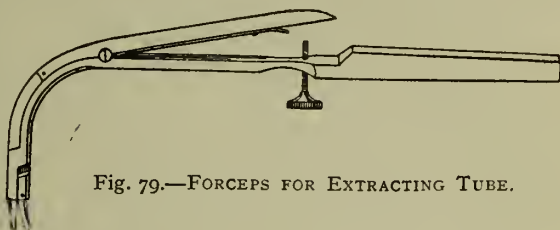


Fig. 79.—FORCEPS FOR EXTRACTING TUBE.

bandage must be impregnated with some material which will harden after the application, such as plaster of Paris, starch, water-glass or Unna's paste.

Plaster of Paris bandages are made of unstiffened crinoline muslin. The plaster is rubbed into both sides and the bandage then rolled up loosely.

For dressings, gauze bandages, either plain or containing some anti-septic, are used especially after operations where it is desirable to get firm pressure.

The form of bandage most commonly used is the roller, and it can be applied in four ways—a simple spiral, a spiral with reverses, a figure-of-eight turn, and a spica.

The **simple spiral** is rarely used to retain dressings in place, as it is neither neat nor firm if made with an unstretchable bandage, but it is the only variety used with elastic bandages.

Reverses are made in a spiral bandage so that it fits snugly round the increasing thickness of the limb. For example, in bandaging the leg the bandage starts as a simple spiral, and as it meets the swell of the calf reverses are made in it. To make a reverse the bandage is fixed with the thumb of the left hand, the bandage held loosely, and then turned downwards, on itself, and in this reversed manner is made to encircle the limb again. A second reverse is then made in a line with the first, and this is continued until the limb is completely covered.

The **figure-of-eight** has the same object as the spiral with reverses, viz. to lie snugly upon the limb. The bandage encircles the limb in a simple spiral, but when half way round the direction is changed, and it finishes as a spiral downwards; at the complete circle the spiral again becomes ascending, but at a higher level than the first, and this is continued until the limb is covered with a series of loops of ascending and descending spirals.

The **spica** is a modification of the figure-of-eight, and is used where the limbs are joined to the trunk. One loop of the figure-of-eight passes round the body, and the other round the limb, and the turns may either pass from above downwards—the descending spica—or from below upwards—the ascending spica.

Except in special instances the bandage should always be applied from below upwards, and from without inwards.

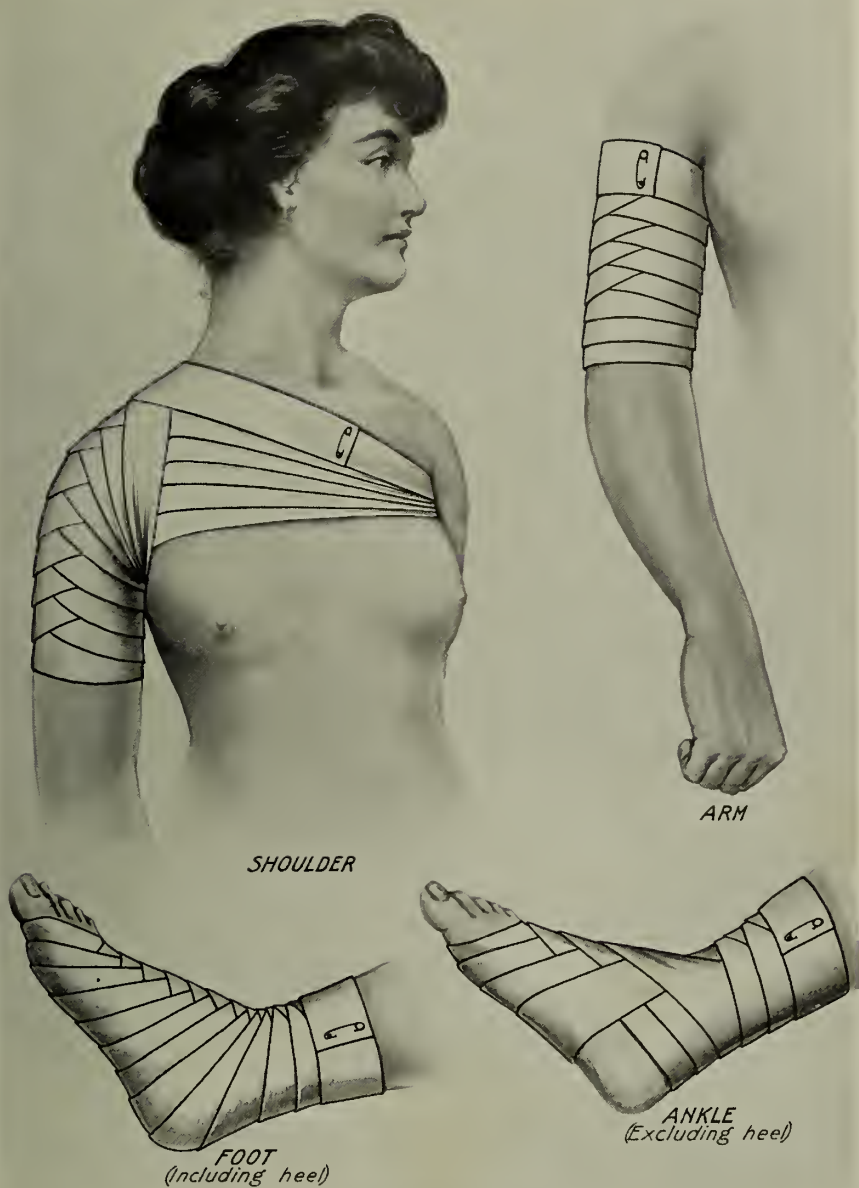


PLATE XLVIII.—BANDAGES FOR THE SHOULDER, ARM, FOOT, AND ANKLE.

BANDAGES FOR VARIOUS PARTS OF THE BODY

1. **Fingers.**—The fingers should be bandaged with the figure-of-eight, and if the wound is near the hand the bandage should start round the wrist, be carried across the dorsum of the hand, enclose the fingers, and then return to the wrist, where it is secured. (Plate XLVII.)

2. **Hand.**—Bandage with a figure-of-eight, starting and ending round the wrist. The thumb should be left free if possible. (Plate XLVII.)

3. **Forearm.**—The wrist may be bandaged with the simple spiral, but as the swell of the forearm is reached either the reverse or the figure-of-eight is used. The figure-of-eight is a little more wasteful of the bandage than the reverses. (Plate XLVII.)

4. **Elbow.**—The first turn of the bandage should be over the olecranon process, and the bandage then carried alternately above and below the first turn. This form of bandage is spoken of as the divergent spica. It is of the utmost importance to remember that the elbow must never be flexed *after* it has been bandaged, otherwise the first part of the bandage may be pulled so tight as to induce gangrene of the forearm by pressure on the vessels. Gangrene may occur in this way without the patient suffering much pain, and disastrous consequences have followed the neglect of this rule when the patient has been sent away and not seen for some days. (Plate XLVII.)

It is always well to bandage the whole of the forearm from below upwards if a bandage has to pass round the elbow.

5. **Arm.**—Bandage with the spiral, with reverses from below upwards. (Plate XLVIII.)

6. **Shoulder.**—Some cotton wool should be placed in the axilla, and the shoulder covered in with an ascending spica. The loop round the body should pass under the opposite axilla and not round the neck. (Plate XLVIII.)

7. **Foot.**—Start the bandage round the ankle and carry it with a few wide spirals to the toes, and then return with a close spiral with reverses on the dorsum of the foot, and finish round the ankle. (Plate XLVIII.)

8. **Ankle.**—If the heel is not to be included the ankle may be bandaged with a series of figure-of-eight turns, but if the heel has to be taken in a divergent spica should be used, the first turn going directly round the heel. (Plate XLVIII.)

9. **Leg.**—Round the ankle a simple spiral bandage is all that is necessary, but when the swell of the calf is reached it should be changed to a spiral with reverses. The bandage is finished by a couple of circular turns just below the knee. (Plate XLIX.)

10. **Knee.**—The knee should be bandaged in the slightly flexed position, and a divergent spica or a figure-of-eight may be used. (Plate XLIX.)

11. **Thigh.**—Use the spiral with reverses. (Plate XLIX.)

12. **Hip.**—Start the bandage on the anterior superior spine on the opposite side, and apply an ascending spica. The large loop must go round the pelvis, *i.e.* it must not rise above the crest of the ilium. (Plate XLIX.) If both hips have to be bandaged a double spica should be used.

13. **Perineum.**—The most convenient form of bandage for the perineum is the T-shaped bandage. It is made by fastening two pieces of stout calico bandage together in the form of a T. The upper or horizontal band passes round the waist with the two ends tied in front, whilst the junction lies over the sacrum. The vertical portion is then brought round under the perineum, and then up in front on one side of the genitals, the end is split, and the two ends so formed secured to the horizontal band with a reef knot. If the dressing on the perineum has to be frequently changed, as when fomentations are being used, the following bandage is convenient.

A horizontal bandage is passed round the pelvis, and the apex of a triangular bandage secured to it behind. The base of this bandage is then carried over the perineum, up between the legs, spread out, and fastened to the pelvic band. (Plate L.)

14. **Lower jaw.**—The bandage generally used is the four-tailed bandage, and is made in the following way—Take a piece of calico bandage, three inches wide and three feet long, and split it longitudinally from either end to two inches from the middle. In the centre of the unsplit portion cut an oval hole about one and a half inches long.

To apply the bandage place the point of the chin in the centre hole, carrying the lower two tails directly over the vertex of the head, and securing them by a knot. Carry the upper two tails round the head above the external protuberance, and secure them in the same way. Finally tie all the tails together to prevent the bandage from slipping. (Plate L.)

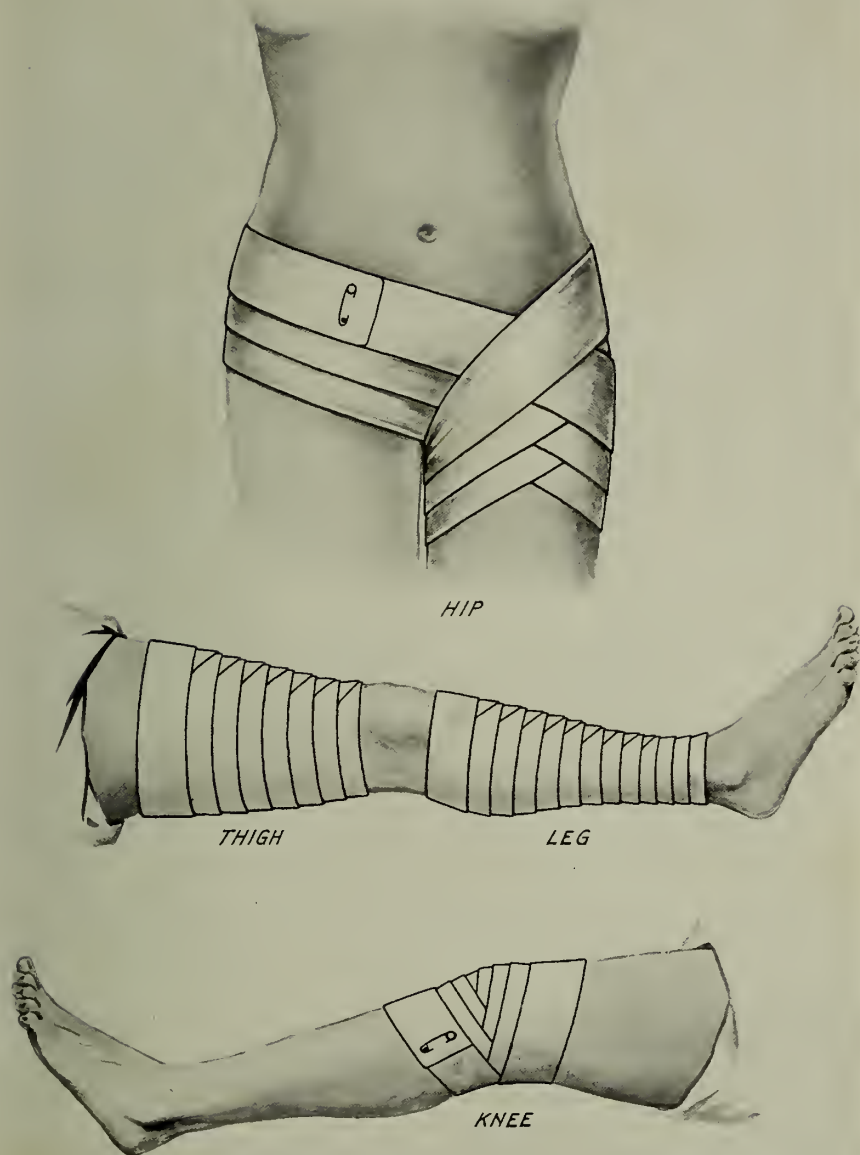


PLATE XLIX.—BANDAGES FOR THE HIP THIGH, LEG, AND KNEE.

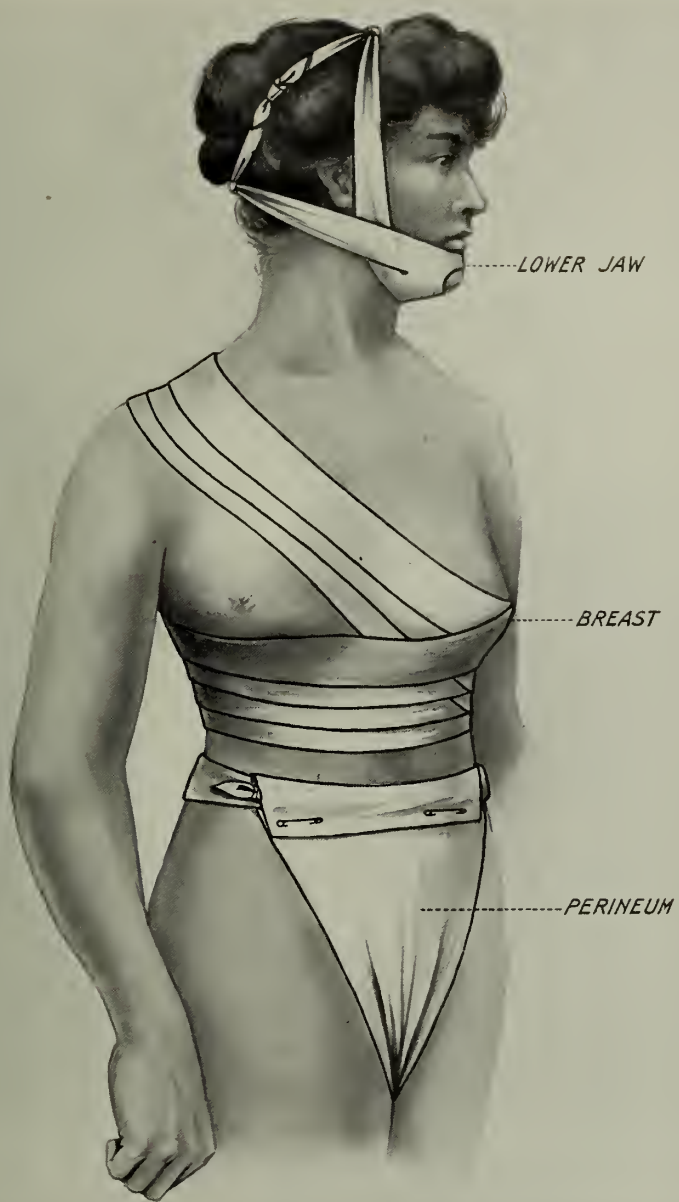


PLATE L.—BANDAGES FOR THE LOWER JAW, BREAST AND PERINEUM.



NECK



HEAD

PLATE LI. BANDAGES FOR THE NECK AND HEAD.

15. **Breast.**—A three-inch bandage is carried twice round the body below the breast and then passed under the diseased breast and over the opposite shoulder. These turns are repeated alternately until the breast is covered. The bandage is really a figure-of-eight with one loop round the body, and the other over the shoulder. (Plate L.)

16. **Neck.**—To bandage the neck efficiently the bandage must be carried round the head and under the axilla of the same side. The first turn should secure the dressing on the neck; the bandage is then carried over the shoulder under the axilla, and round the neck again. These turns are repeated, and the bandage is carried under the ear of the same side, over the top of the head, and under the chin. It then passes round the neck again, and below the ear and round the forehead, so as to secure the first turn over the head. These turns are repeated as many times as are necessary firmly to secure the bandage; the turns may be fixed with safety-pins to prevent slipping. (Plate LI.)

17. **Head.**—To secure a bandage on the head it is necessary to take a turn under the chin. The bandage is carried round the head, and then fixed with a safety-pin over the ear. The bandage is reversed and carried round under the chin and over the head. It is again secured over the ear, and again carried round the head, and these turns are repeated until the dressing is covered. (Plate LI.)

A *triangular bandage* is useful for securing fomentations on the scalp.

The base of a triangular bandage encircles the head while the apex lies backwards over the occipital protuberance. The ends of the base are carried under the occipital protuberance across one another, and pass round the head to be secured with a reef knot in front. The apex of the bandage passes under the cross on the back of the head, and is then turned up and secured with a safety-pin. (Plate LI.)

18. **Many-tailed bandages.**—This bandage is generally used when the dressing has to be frequently changed, but it is also an excellent bandage for abdominal cases. (Plate LII.) It can be made in two ways:—

(1) A piece of bandage material of sufficient length and wide enough to go one and a half times round the limb is taken, and then torn into strips about two inches wide from either side to about two inches from the middle. (2) A number of strips of bandage about two inches wide, and of sufficient length to go one and a half times round the limb, are

sewn together by their middle so that each one slightly overlaps the one above.

In either form of bandage the central part is laid along the back of the limb, and the transverse pieces folded over the limb in a regular order, beginning from below upwards. The upper strips are secured with a knot.

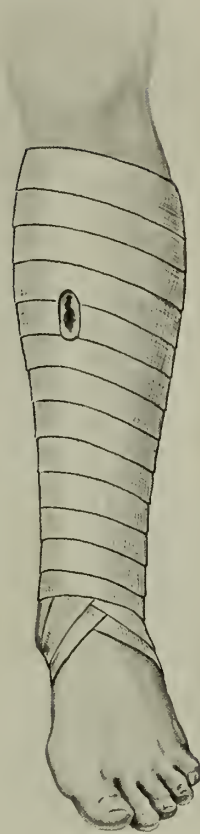
19. **Unna's bandages.**—After the skin of the leg has been well washed a carbolic gauze bandage is applied from the foot upwards without reverses. (Plate LII.)

The Unna's plaster should be heated on a water bath, and, when liquid, plastered into the bandage with a brush ; a second gauze bandage is then applied, and another coat of plaster, and this is repeated a second time.

If the surgeon orders it, a window should be left in the plaster over the ulcer, so that it can be dressed.



MANY-TAILED BANDAGE



UNNA'S BANDAGE

CHAPTER XXIV

THE NURSING OF INFECTIOUS DISEASES

BY EDITH SANDFORD

GENERAL CONSIDERATIONS: The Sick-room—Aspect, Appointments, and Ventilation—Importance of Cleanliness—Prevention of Bed-sores—Administration of Nourishment—Reports for the Doctor—How the Nurse can help Him—Isolation and Disinfection—The Nurse's Duty to Herself. Scarlet Fever—Measles—German Measles—Chicken-pox—Mumps—Whooping-cough—Erysipelas—Diphtheria—Typhoid—Typhus—Smallpox—Cerebro-spinal Fever—Influenza.

GENERAL CONSIDERATIONS

THE subject of this chapter is the nursing of ordinary infectious diseases, excluding those usually classified under the head of Tropical Diseases, which are to be dealt with in the next chapter.

Before proceeding to describe the different kinds of fevers, with the various stages of each, and the special points to be noted in the nursing, I may point out that until a nurse has worked for some months in the wards of a hospital for infectious diseases, it is impossible for her to realise the great interest of this branch of nursing work, and the necessity that the nursing should be of the highest quality. It is all skilled labour, and is a field of work for the best and most intelligent women in the profession. A nurse who can cope, for example, with a bad case of enteric, with a full grasp of all its complications, and who can carry out any or all of the many courses of treatment prescribed by different doctors, may consider herself fit to undertake any medical case. Nor will the skill of a good surgical nurse be wasted. Operations often have to be performed in fever work. A knowledge of maternity work, too, is often needful.

In no branch of nursing, again, is the general cleanliness of patients and their surroundings, or a knowledge of disinfectants and antiseptics,

more necessary. It is well also that a nurse should have had experience in mental nursing.

Fever nursing needs great self-denial, for the nurse is called upon to do many things for her patient in which in general work she would be helped by others. It is not too much to say that to no class does the community generally owe a greater debt of gratitude than to the doctors and nurses who successfully combat infectious disease and prevent it from spreading; who so treat the patient as to make his isolation as little irksome as possible, and at the same time with such skill as to guard him from complications and sequelæ and ensure his complete recovery.

Let me now briefly set out the rules which apply to all cases of infectious disease, as a foundation on which the nurse must build. It is hardly necessary to insist upon the necessity for skilled and scrupulous attention to the very minutest details of her work, the mastering of which can alone make her successful in this most responsible branch of nursing work.

She has to consider four different aspects of her duty; first, to her patient; second, to the doctor; third, to the community; fourth, to herself.

1. **The patient.**—The room, or rooms, in which the patient is to be isolated should, if possible, be at the top of the house, for three reasons: (1) isolation is more complete; (2) the room is quieter; (3) bad air ascends, and the chimney or faulty ventilation shaft from a room in which an infectious case is being nursed may convey the disease to those in a room above. This is especially the case in measles and typhus fever. Of course, in a fever hospital special precautions are taken in the construction to avoid such a thing, but it is different in private houses.

The *aspect* should be south or west. No curtains or carpet are allowable, no stuffed sofas or chairs, as little furniture as possible, and only articles which can be scrubbed and cleaned. The bed should be a spring bed with one hair mattress and no valance, and placed in such a way that the light and sunshine, which should be freely admitted, does not fall on the patient's face; nor should it be in a position where the nurse, while attending to her patient, must stand between the bed and the chimney towards which the infectious air is constantly passing. Light and air help to kill the poison which is being expelled from the patient's body by

the lungs, the skin, or the excretory organs. In pointing out on the map of a large city the parts which had suffered more and less severely from an epidemic of fever, the Medical Officer of Health showed that the district where most cases occurred was the one which enjoyed least sunlight and fresh air. The shady side of the street had the cases, the sunny side was almost exempt.

The *ventilation*, too, should be free, without draught. A fire, even in summer, should be kept burning ; it is necessary as a help to equable temperature, and also for the consumption of rags, food, refuse, dust, etc., and further, it aids ventilation. A lavatory not used by others should be set apart. No food of any kind should be kept in the room ; everything must be brought in as wanted. Milk and water must not be allowed to stand beside the patient. The nurse must regard as a source of infection everything that has been in the room, including herself till she has been disinfected.

Personal *cleanliness* for the patient and all that has been used in connection with him, is essential. Floors should be wiped over with a damp cloth soaked in disinfectant at least once in the day. The temperature of the room should be kept at about 60°, in some cases higher. The temperature of the patient, the pulse, and the respiration must be regularly charted. The amount of nourishment taken, both solid and liquid ; the quantity of sleep, the delirium, the medicines, and the state of the bowels must all be carefully noted. The urine must be measured, and in some cases tested. The nurse must be competent to give hot or cold packs, and to understand the various methods of applying heat or cold (*see* Vol. II., pp. 184-88). She must be able to sponge the patient quickly between blankets without risk of chill (Vol. II., p. 174), must understand how to prevent bed-sores (Vol. II., pp. 177-79), must realise the care needed in the application of hot-water bottles or tins (Vol. II., p. 179). She must learn to do all these things without raising her patient, remembering that high temperature affects the heart, and particularly when the poison of fever is present. All sheets must be changed by the patient being gently rolled from side to side (Vol. II., pp. 170-71), the pulse being watched carefully after each exertion, and nourishment and stimulant administered as found necessary. The mouth must be often cleansed, and the teeth carefully attended to. In the case of an unconscious patient the nurse must do this with forceps and wool, or with a piece of stick covered with a rag ;

she must never put her fingers into the patient's mouth. The hair is usually cut off, but in any case must carefully be kept clean.

To prevent bed-sores the patient's back must be frequently rubbed with the nurse's well-soaped hand, then washed and dried, and spirit of some kind rubbed in ; it must also be powdered well with the hand. Continuous pressure of any one part of the body on the bed is to be avoided, and special care must be taken of the elbows, heels, the backs of the ears, and, in children, the back of the head. (*See also* Vol. II., pp. 177-79).

Nourishment has to be carefully administered, and its effect watched. Plenty of water should be given to drink, and it is wise to boil both water and milk. The nurse should be practised in sick cookery ; she must understand how to make simple puddings, refreshing drinks, beef tea, and broths, and how to vary the diet ordered for her patient, which otherwise might be monotonous. Various gargles, mouth washes, and disinfectants will be ordered by the doctor, and must be carefully used and kept apart from internal medicines, and from food. The nurse must remember that for the time being the patient depends entirely upon her ; she must be particularly careful during the time he is apparently unconscious, as often he will understand and hear what she says, and yet will be unable to tell her that he is distressed by hearing his condition remarked upon. His eyes must be carefully shaded from any artificial light used in the room. All medicines and medical appliances of every kind must be kept out of sight. If a second room is not available, a clothes screen, with a washing cover over it, is useful for this purpose.

2. The doctor.—The nurse must be careful to give accurate and detailed reports of her patient's condition and symptoms—few words and to the point—facts, not her own opinion, unless it is specially asked for. She must not trust to her memory, but must write down at the time everything she notices. Minute directions should be asked for as to how she is to act in any sudden emergencies, and she may also ascertain how far the doctor will allow her to act on her own responsibility. She must be guided by him as to what she is to say to the relations and friends, and it is wise to ask for leave to use his authority to help in the carrying out of strict rules as to isolation, quarantine, and disinfection. A skilful nurse will save the doctor as much actual touching of the patient as possible. It is well to have a loose linen coat

for him to wear while in the sick-room, to have clean water, towels and disinfectant ready for his hands when he has finished his examination of the patient. In keeping specimens, etc., for his inspection, place them in a glass vessel, with a piece of wool soaked in disinfectant over the top, or else in a china vessel with a piece of glass on the top.

3. **The community.**—The nurse should carry out faithfully the minutest details for isolation, remembering that otherwise both the patient and herself are a source of danger to the public, and that careless nursing of a single case of infectious fever may cause an epidemic in a town. Keep a sheet wet with disinfectant over the outer door of the room or passage; the end of the sheet should rest in a bath, and it should be sprayed and kept wet with carbolic, 1 in 40, or weak solution of lysol. This measure is useful as a danger signal. It should be remembered that all discharges from the patient are infectious, and must stand for some time in strong disinfectant before being emptied into a public drain. Ten minutes' exposure to strong carbolic is necessary. No one who is going among healthy people must be allowed in the room, with the exception of those who are on duty; all persons who have come in contact with the patient must undergo the proper quarantine and disinfection before mixing with others. The commencement of the period of quarantine must date from the last exposure of the person to infection. All books taken into the room must be burnt, and the nurse must not do any needlework or engage in any occupation in the room which may afterwards convey infection to others. All clothes for the laundry should be soaked for some hours in 1 in 20 carbolic, and if possible should be boiled. All soiled sheets should be cleansed at once before being put into disinfectant. A basin of disinfectant should be kept for the nurse's hands, and must be used whenever she has touched her patient. When the patient is declared free from infection he should have a disinfectant bath—lysol, for example; the head must be washed, and clothing put on which has never been in the sick-room. The nurse must remember to put on a clean overall, or have on a clean dress, before she disinfects her patient.

To disinfect the room use a formalin lamp or sulphur candle, first stopping up the chimney and the key-hole, and pasting over any cracks there may be. Open all the drawers and cupboards, and hang up blankets, and any garments lying loosely about. Mattress and pillows

after this must be disinfected by steam. Leave the room under fumigation for 12 hours, and for another 12 with open windows. Burn all books, toys and clothes, particularly shoes. Utensils should be boiled. It is a dangerous practice to send on things that have been used in an infectious room to a fever hospital, unless care is taken to mention the particular fever from which the patient has been suffering. The room must be well scrubbed with disinfectant, the ceiling whitewashed, the walls scraped and repapered. In the case of oil paint, careful washing is all that is necessary. After all this work is finished, the nurse must remember not to go to another patient until she has undergone the proper quarantine, unless to one suffering from the same fever.

4. **The nurse.**—The nurse must remember to eat well—not, of course, in the infected atmosphere. If she is inclined to suffer from sore throat, she must use gargle and mouth wash frequently—in any case this is an advantage. She must observe the strictest rules of personal cleanliness. If possible out-of-door exercise should be taken daily. All out-door things must be kept outside the infected room. Care must be taken to secure the thorough disinfecting and cleansing of hands before eating food; use plenty of soap and water, and a nail brush, which must be boiled occasionally. The apron should be changed frequently. Care must be taken, too, not to catch the patient's breath. Cups and all utensils used by him must be kept quite separate.*

SCARLET FEVER

is both infectious and contagious in a high degree. The usual incubation period is from two to five days, but it varies between one and eight days. The quarantine period is fourteen days.†

Symptoms.—The invasion is marked by sore throat, headache, vomiting, general feverishness, thirst, high temperature, and, in children, often convulsions. The rash appears within 24 hours; it is first seen on the chest and arms, a diffuse blush looking as if a mustard plaster had been applied (Plate LIII., Fig. 1). The tongue is red and raw, furred, and like a ripe strawberry. The throat is red and swollen, and sometimes patched. The infective period is from the commencement of incuba-

* For further details as to the precautions the nurse should observe to avoid infection, see Vol. II., pp. 136-38.

† A tabular summary of the incubation and quarantine periods and leading symptoms of the common infectious diseases will be found in Vol. II., pp. 116-17.



PLATE LIII.—ERUPTIONS OF (1) SCARLET FEVER, (2) MEASLES, (3) TYPHOID FEVER.

tion till all desquamation, and discharges from the ears, throat and nose, have ceased.

Transmission.—The infection can be conveyed by a third person, also by direct contact with the patient, with the desquamations and discharges above mentioned, or with articles, such as clothing, books, and toys, that have been touched by the patient. An attack of fever generally affords permanent protection, though second and even third attacks have occurred.

The different kinds of scarlet fever are (1) *simple scarlet fever*, (2) *scarlatina anginosa*, in which there is serious throat trouble, (3) *malignant scarlet fever*. This third form comes on very suddenly, with excessive and persistent vomiting, and very high temperature, rising perhaps to 106°, and with widespread eruption, often containing blood spots. Death may supervene on the fifth or sixth day, preceded by delirium.

Nursing points.—The patient must be kept in bed for at least a fortnight, even in a mild case, for complications are quite as common in slight as in severe cases. In fever hospitals the usual routine is three weeks in bed. The clothing must be warm; wool is best. The throat needs careful attention; it must be well swabbed and gargled from the first. In young children gargling is often impossible, and in this case swabbing and sometimes the use of the throat syringe are necessary. The glands are often swollen and painful, and poultices and fomentations may be applied.

The *diet* of the patient is of extreme importance. Milk alone is given till the temperature falls, which in an ordinary case it does when the rash is fully out, then for three weeks milk puddings, white soups, tea, bread and butter, jelly, and stewed fruit, and plenty of water to drink, also barley water. After the three weeks, fish, chicken, and rabbit may be allowed, but no red meat for at least six or seven weeks. The patient must be sponged all over daily. The doctor may order an ointment during desquamation, but this is seldom used now. In delicate people, and in children, where the rash is profuse, soreness of the skin may come very easily; care must therefore be taken to avoid rubbing and irritation by the clothes. The urine must be measured daily, and tested at least twice a week; the bowels kept regular, but no violent purges given without a doctor's orders. It is of great importance to avoid chill when the rash first appears; what would be

a mild case of scarlet fever may be aggravated into a severe attack by careless nursing during the first few days.

Complications.—*Nephritis* may occur any time after the second week, and may come from a chill or an error in diet. The signs of nephritis are these: the water becomes scanty in quantity, and very dark in colour, of a smoky hue, indicating the presence of blood. There is swelling of the legs and feet, eyelids and face, with thirst, headache, persistent pain in the back, and sometimes a rise in temperature. When this happens the patient is put at once on a strictly milk diet; he must be placed between blankets, with hot bottles carefully covered with flannel, must have plenty of liquid to drink, and purges should be freely administered. Hot poultices should be applied over the loins, and sometimes a hot-air bath is ordered. The patient is placed in blankets, the nightgown is taken off, a cage covered with blankets and then a mackintosh is placed over him, and a lamp, lighted by methylated spirit, with a long funnel, is introduced at the lower end of the cage. While he is in this bath the patient's pulse must be carefully watched; if it keeps steady and there are no signs of exhaustion, he may be kept there from half an hour to an hour. Hot drinks can be given at the same time. When free perspiration has been set up the cage and the blankets may be removed, the patient quickly rubbed down with a dry hot towel, and a fresh warm flannel nightgown put on. He must be left surrounded with hot bottles.

Instead of the hot-air bath some doctors order a hot pack, which may be given by enveloping the patient in a blanket wrung out of hot water, then covering him with blankets and mackintoshes, and surrounding him with hot bottles in the same way as in a hot-air bath.* Great skill is needed in both these applications.

Rheumatism often appears early in the disease, and is usually marked by a rise of temperature, pain in and swelling of the limbs, and profuse perspiration. This complication is treated by putting the patient between blankets, wrapping the limbs in cotton-wool and bandages, keeping him very quiet and on milk diet. Be careful to avoid chill, and change the nightgown and blankets frequently when damp.

Ear trouble.—This is sometimes characterised by severe pain, which, with any swelling that may be noticed behind the ear, must be at once reported to the doctor. A bandage should be placed round the head

* See also Vol. II., p. 188.

coming behind the ears, with cotton-wool; soothing poultices and fomentations are often a relief. In the case of discharging ears syringing must be carefully and regularly done; boric acid lotion, warmed, is generally used for this purpose. A kidney dish is held beneath the ear, the syringe is filled with warm lotion, and the ear carefully washed out till the lotion comes out clean. Care must be taken to do this gently, and when it is finished to wipe out the ear with a bit of cotton-wool on a pair of forceps, as any liquid left behind may do harm.

In a severe case, where the rash does not come out, or may be driven in by chill or non-attention, the same remedies as those used in Bright's disease may be ordered, but in all cases of scarlet fever the great nursing treatment is rest, warmth, and careful attention to diet. For the throat, listerine, thymoline, and sometimes Condyl's fluid are used. In severe throat poison, which occurs in scarlatina anginosa, the syringing of the nostrils as well as the throat may become necessary. As disinfectant for the room, a weak solution of lysol may be recommended; for the clothes, 1 in 20 to 1 in 40 carbolic; for the disinfection of the nurse's hands, lysol.

After the three weeks, when the temperature has fallen, a bath should be given daily, as this aids desquamation. The feet take the longest to peel; great harm is often done by either patient or nurse trying to cut and pull off the skin; this makes for roughness, and often results in retarding the time when the patient becomes free from infection. Besides having the bath, he may soak the feet once or twice daily. If a garden is available, he may go out in fine weather after the fourth week, but it must be in a place in which he can be completely isolated, even after desquamation is finished, if any discharge of the ears, eyes, or nose is present, for in that case he cannot be declared free from infection. During the first three weeks of the illness he will be kept very strictly in bed, and only lifted out in blankets occasionally to have the bed made. Sometimes in the case of very young children, when the nurse cannot always sit beside them, it is advisable to dress them warmly and let them roll about the bed; they will then run less risk of chill.

The time the infection lasts depends on various circumstances. In a mild case, where the rash has not been profuse, the desquamation is often slow and tedious. In cases where the throat and ears have been much affected the discharge is long in ceasing—in delicate and unhealthy children it may continue for months, and if possible isolation should be

continued for a longer period than the ordinary, sometimes extending to eight or ten weeks. The after-disinfection of the room must be carefully attended to. By a strict carrying-out of these rules in the nursing of the first case in a town or a school, an epidemic may be often checked.

MEASLES

In early days this disorder was regarded as a minor form of smallpox. Afterwards it was confused with scarlatina, until in the seventeenth century, Sydenham, the famous physician, distinguished between the two diseases. The period of incubation is ten to fourteen days; quarantine, about sixteen days.

Symptoms.—The invasion is marked by signs of severe cold—eyes watering, throat red, sneezing, and general symptoms of catarrh. Small spots occur on the inside of the mouth, there is general feverishness, with a hard short cough. The rash (Plate LIII., Fig. 2) appears on the fourth day, is blotchy and red, sometimes crescentic in appearance, in bad cases dark purple, and almost black. The temperature, which may rise to 104° or 105° , falls as the rash fades, if there is no complication. Measles varies a good deal in severity. In one variety, while the rash is well marked, there is little or no cold or cough; in another these latter symptoms may be prominent, and the rash may be insignificant—a vague mottling on the back of the hands, the neck, and the thighs, or a few patches of redness. Malignant or black measles, which is usually fatal, is now seldom met with. It is marked by a dusty or bluish black rash, a dry brown tongue, delirium, and convulsions.

Transmission.—The infective period lasts from the commencement of incubation to a full fortnight after the invasion. The infection is conveyed by the breath and exhalations, and by the discharges from the nose, mouth and eyes, which, if they get on to the nurse's apron, may be carried to another patient.

Nursing points.—In all cases of measles the *diet* needs attention; plenty of nourishment, chiefly liquid, should be given. Severe vomiting, and diarrhoea and gastric affections, frequently occur in children, and are often fatal if not arrested. Whey milk and weak chicken tea may be given.

The patient is to be kept strictly in bed for at least ten days, and in a severe case for longer. An equable temperature of the room and plenty of fresh air are very necessary, especially where chest complica-

tions are present. The pulse and respiration must be carefully counted when the temperature is taken, and any increase at once reported to the doctor.

Complications.—These are chest mischief of all kinds—pneumonia, bronchitis, broncho-pneumonia—laryngitis, abscesses from the swelling of the glands, ear trouble, and severe inflammation of the eyes, which is highly contagious, and can be carried by a third person.

In *chest complications* the temperature of the room must be at least 65°, with free ventilation. A gamgee jacket or poultice may be ordered by the doctor, also steam kettles and inhalations. In applying poultices special care must be taken. The application of either heat or cold must be continuous, and therefore one poultice must be ready to go on immediately the cold one is taken off; nor should a poultice be left on for more than three to three and a half hours. Linseed is generally used, and must be quickly made with boiling water, spread carefully on a piece of rag or flannel, and tested by putting the poultice to the nurse's cheek before applying it to the patient. This is specially needful in the case of babies and delicate children. The poultice must be covered with cotton wool and mackintosh. Steam kettles must be boiling, and the steam issuing freely from the spouts before being put near the patient. A bronchitis kettle is the best, but an ordinary tea kettle with a long spout and a roll of paper to form a funnel may be used. The steam, like the poultice, must be continuous. The patient should be carefully sponged with warm water.

In *inflammation of the eyes* all rags and wool should be burnt at once, and great care must be taken by the nurse not to touch her own eyes after attending to a patient till her hands have been carefully washed in disinfectant. In the nursing of these eye cases great care is needful. The eyes must be carefully shaded from light; they must be frequently bathed with boric acid or other lotion, and never touched twice with the same piece of wool, particularly when one eye is affected more than the other. Sometimes compresses over the eyes in severe inflammation are a relief. In children want of care in this respect may cause blindness. The nose and the mouth also must be kept very clean.

The *sequelæ* of measles are ear trouble, weak eyes, tendency to pneumonia and bronchitis, and in delicate children a long period of ill-health and weakness. Careful nursing and good nourishment often prevent these conditions from being set up.

After a case of measles the sick room should be disinfected by burning in it sulphur and formalin before the cleaning, and the bedding and articles of clothing must be removed and stored. Isolation from healthy children should be maintained for three to four weeks.

GERMAN MEASLES (RÖTHELN)

This affection assumes various forms, in some cases resembling measles, in others mild scarlet fever. The incubation period is fourteen days; the quarantine period about sixteen days.

Symptoms.—The invasion is indefinite; there is a general feeling of illness, sometimes sore throat, and glands are to be felt in the neck. The rash comes out on the first or the second day. The fever is slight, and the rash copious. It resembles the rash both of measles and of scarlet fever, but the lesions of the former are not crescent-shaped as in measles, nor is there the uniform redness characteristic of scarlet fever. First appearing on the face, it shows a predilection for the back, chest, and neck, the front of the arms, and the back of the thighs. It has usually faded by the third or fourth day. There may be no feverishness, or if there is, it is slight.

Transmission.—Infection is conveyed by exhalations from the body, and as the result of direct contact with the patient. The infective period is from three to four weeks. There are no complications or sequelæ.

Nursing points.—The patient must be kept in bed for at least a week, very warm, and after the week must still remain in one room. The diet will be light and nourishing. Great care must be taken to avoid sudden chill or cold. The usual means of disinfection should be carried out, and complete isolation both of nurse and of patient is necessary.

CHICKEN-POX (VARICELLA)

This affection is believed to be named by way of allusion to *chick-pease*, as descriptive of the rash. The period of incubation is from ten to fifteen days.

Symptoms.—The rash comes out early in little red spots, soon becoming blisters filling with clear fluid, then with matter (Plate LIV., Fig. 1). They come out in crops, and are seen on the body in these three stages at once—this marks their difference from smallpox and is often a help to the doctor in diagnosing a case. The invasion is indefinite, and often the spots are the first sign that anything is wrong.

Transmission.—The infective period lasts from the commencement of the illness till all the scabs are off. It is communicated by contact with the patient, or with anything he touches, and may, like scarlet fever, be conveyed by a third person. It is most frequently disseminated by children who are just convalescent, and who are allowed out before the body is quite free from scabs.

Nursing points.—The patient must be kept in bed, warm, and fed with light and nourishing food. Care must be taken not to rub the spots, and therefore sponging when the rash is out is to be avoided; a warm bath, given carefully, is best. If the spots are rubbed they may become very sore, and often in delicate children are difficult to heal; in giving the baths, therefore, the nurse must be very careful not to irritate them. Usually some simple ointment is applied to prevent scratching on the part of the patient. The rash is often present on the face, and if the child is allowed to rub or pick the scabs, it may become marked as in the case of smallpox. This good nursing prevents. Isolation of nurse and patient, and careful disinfection, and destruction of all toys, books, etc., are as necessary in chicken-pox as in scarlet fever. In severe cases the best nourishment is called for—eggs, beef-tea, and plenty of milk—for a bad attack very often makes children exceedingly delicate. Adults sometimes take this disease, and it is apt to be more severe in them than in those of tender years.

MUMPS (EPIDEMIC PAROTITIS)

This affection is believed to be due to a germ, which has not yet, however, been identified. The incubation and the quarantine period are both three weeks. The infective period lasts for at least three weeks, and one week from the disappearance of all swelling of the salivary glands. The infection is spread by contact with the patient.

Symptoms.—The invasion is marked by fever, swelling and pain under one ear; later the other side also may be affected.

Nursing points.—The patient must be kept very warm, poultices and hot fomentations will be applied to allay the pain, which is usually very severe. Nourishment, which is often difficult to administer, owing to the stiffness of the jaws and the impossibility of moving the mouth without severe pain, must nevertheless be given frequently. Liquids are all that can be taken for some time, and they must be as nourishing as possible. Switched eggs, beef-tea, and plenty of milk are given.

The **complications** are swelling and inflammation of glands in various parts of the body. The infection is very tenacious, and as the period of quarantine is long, mumps may be present for many weeks in a house where a number of people have been exposed to the infection. Special care must be taken in the disinfection of the room, as infection clings to anything that has been near a patient.

WHOOPIING-COUGH (PERTUSSIS)

Whooping-cough is very contagious, and is apt to come in epidemic form during the spring and autumn. The incubation period is fourteen days, but may be less; quarantine, three weeks.

Transmission.—The infection is spread by the breath, and by discharges from the nose and mouth, and may be carried by the clothes, but contact with the patient is the most common means of transmission. The infective period usually lasts from five to six weeks, till all whooping ceases. The spread of the disease is assisted by the fact that it is markedly contagious in the early stages, before the peculiar “whooping” has developed, which may not be for some weeks. As a rule, one attack confers permanent immunity.

Symptoms.—The invasion is marked by symptoms of severe cold, running at the nose, sneezing, watery eyes, and a harsh, dry cough, somewhat similar to that of measles. In the next stage, the cough becomes paroxysmal, the child gets red and blue in the face, and is often sick. There are slight feverishness, loss of appetite, furred tongue, and general uneasiness. The cough grows more troublesome, especially at night.

Complications.—Whooping-cough may be complicated by lung and chest diseases, especially broncho-pneumonia, by diarrhœa, and by wasting and convulsions. Collapse of the lung may occur, due to blocking of the bronchial tubes with mucus. Sudden death may be caused by spasm during a fit of coughing.

Nursing points.—Keep the child in a warm room for the first ten days or fortnight. How long this is necessary depends upon the state of the weather, the condition of the patient, and the severity of the attack. Cold and damp, and imprudent exposure, are frequently the cause of complications. For the first few days it is wiser to keep the child in bed; the temperature of the room must be not less than 60°, and 65° is better. The ventilation must be free, especially in a case of broncho-pneumonia. In one of the large fever hospitals recently the death-rate

from broncho-pneumonia in whooping-cough was very much reduced by the children being nursed in a large room with four windows from which the glass was entirely removed. This was in winter ; in summer the cots were carried out and left in the sunshine. These measures, of course, needed great care on the part of the nurses to keep away draughts and damp ; a large fire was always kept burning in the room, and the temperature was well maintained, although the windows were never closed. The bed-clothes were light and warm, hot bottles were in constant use, and it was noticed that when from some cause or other it was necessary to move a case back to the general ward before complete convalescence was established, the child could not sleep, and its breath quickly became distressed, and the cough much more violent. The air was kept moist, and steam kettles were frequently going.

The *diet* is of great importance in this affection. During the initial stage, when fever is present, milk and broths will be given at intervals. The diet must be nutritious, frequently administered, and carefully prepared, as digestion is much impeded. All simple light foods are allowed. A meal will very often be quickly rejected by the child, in which case a smaller amount of nourishment must be given after a very short interval. Sometimes it is necessary to resort to feeding by nutrient enemata. Throat sprays and steam kettles with a little antiseptic in them are frequently of great use. If a vaporiser is used, the best drugs are cresolene, eucalyptus, creasote, and carbolic acid. In favourable weather, change to a warm, dry, bracing place after the period of five or six weeks has elapsed, and the child has been well disinfected, will be found of great benefit. A warm bath, given before the fire, is useful, and the chest should be rubbed with some simple warm or camphorated liniment, and kept warmly covered afterwards with a gamgee jacket.

Constant nourishment and care as to these various details may be the means of preventing prolonged ill-health and delicacy in the child after a severe attack of whooping-cough. Give plenty of liquid, and even in an apparently simple case watch carefully for any symptoms of lung complications.

ERYSIPELAS

This affection, otherwise known as rose, or St. Anthony's Fire, is very contagious, and before the antiseptic and aseptic system of treating wounds prevailed, was of common occurrence in the surgical wards of our hospitals.

There are two kinds of erysipelas: (1) traumatic, or surgical; (2) idiopathic, or medical. The occurrence of the disease without some slight abrasion of the skin is, however, rare. A case of idiopathic erysipelas may communicate surgical erysipelas to a patient who has a surgical wound. The two kinds are similar in their symptoms, and are both due to a microbe. The skin of the affected part becomes hot, red, and swollen, and there is a smarting or burning pain, with fever, shivering, perhaps a rigor, vomiting, loss of appetite, and malaise. There is often sore throat, and herpes on the lips.

The incubation period is from three to seven days. Infection is the result of contact with a patient, but it can be carried by a third person to a surgical case or to a lying-in woman. The infective period lasts till all symptoms of the disease have ceased.

Nursing points.—The essential points of good nursing are complete isolation of nurse and patient, rest, warmth, and light, nourishing diet. The patient must remain in bed, and the bowels be kept well open; usually saline purges are given. The eyes should be carefully shaded from the light; the application of ice is advisable if headache is severe. When the eyelids and face are severely affected they become swollen, very much the same as in a severe attack of smallpox; if the throat is attacked a similar result ensues. Stimulant must not be given without the doctor's orders. In medical erysipelas the inflamed parts may be dusted over with a simple powder of boric acid, oxide of zinc, or starch, and covered with cotton-wool and bandages. Sometimes ichthyol ointment is used, and a linen mask applied over the face. If the mouth and throat are affected, gargles and mouth washes of boric acid, listerine, or Condyl's fluid will be used. Ice sucked in small quantities is also most helpful. Poultices and fomentations are sometimes used.

The nurse must be careful to cover any cut or crack she may have on her hands, and not to touch her eyes, or indeed any part of her face, without first carefully disinfecting her hands. Extreme quietness in the room and the patient's surroundings is necessary, as violent delirium, especially in those addicted to taking alcohol, is common, and often fatal. The part of the body affected by erysipelas must not be washed until the doctor gives leave. The nurse must be careful not to go near any other patient while she is nursing erysipelas. • In the case of a district nurse a special dress, apron and sleeves must be kept, if an erysipelas

patient is to be attended to at the same time as others. A maternity nurse, of course, cannot attend this disease.

Thorough after-disinfection of patient, room, and nurse is necessary.

DIPHTHERIA

is highly contagious, and spreads from person to person by communication of the diphtheria germ. The period of incubation is from two to four days; quarantine, ten days. Infection is caused by contact with the patient, and also is carried by air, and clings to things touched by the patient. The infective period lasts till all trace of the diphtheria germ is gone from the throat—sometimes many weeks.

Symptoms.—The invasion is marked by sore throat, pain in back and limbs, great feverishness, and sometimes digestive disturbances. The throat becomes red and swollen, patches of false membrane appear on the tonsils, and spread to other parts. They are of a greyish yellow colour, not easily removed, and leave behind them a bleeding surface. If the false membrane extends into the larynx the affection is called membranous croup. Nasal diphtheria, in which the membrane extends into the nose, is severe and dangerous. Tracheotomy is often performed, and also intubation.*

Nursing points.—Complete isolation of patient and nurses is necessary. Doors should be covered with sheets dipped in carbolic or lysol. All rags, swabs, and wool that are used for the patient must be burnt at once. The patient must be kept flat, and moved only gently from side to side. Give nourishment frequently, and plenty of liquids, particularly barley water, as the kidneys are often affected. The patient should be well supplied with eggs and milk, and beef-tea. The pulse must be carefully watched, and stimulants administered at once if it becomes weak and irregular. Swab and spray the throat constantly. If the doctor asks for a swab for microscopic inspection, a piece of dry wool should be taken and passed quickly over the affected part of the throat, and placed at once in a piece of gutta-percha tissue. The patient will not be allowed to sit up for any purpose whatever; the examination of the throat and all treatment must be carried out with the patient on the back or side. Measure and test the urine,† as albumen is often present.

If antitoxin is given, prepare the skin as for a surgical operation,

* See *ante*, p. 78.

† See Vol. II., pp. 160-62.

and see that the needles to be used are carefully boiled. After this treatment a rash often appears, and the limbs become painful and swollen; they should be wrapped in cotton-wool and treated as if for rheumatism.

Complications.—A common complication of diphtheria is *paralysis*. The first symptoms are shown by the patient speaking through the nose, and by liquid nourishment passing down the nostrils. This condition may spread to the limbs and the eyes. It often occurs during an advanced stage of convalescence. *Nasal feeding* is frequently resorted to in these cases. Pass a warm, well-oiled, rubber catheter into the nostril; move carefully, without forcing, till you feel it beginning to slip down. After the tube has passed sufficiently, let the patient rest for a minute till all discomfort from the passing of the tube has subsided. A glass funnel must be attached to the end of the tube; through this warm liquid nourishment may be gently poured. Care must be taken not to let air into the tube. Food must be given slowly, and in small quantities, as the stomach will quickly reject either too large a quantity or food too quickly given. Milk, eggs, soups, and liquids of all kinds may be given in this manner.

Constant watch must be kept for the dread symptoms of *heart failure*. In cases where this complication is threatened, the pulse becomes weak and irregular—sometimes rapid, sometimes slow and intermittent. The treatment is to lower the head and raise the foot of the bed. Give stimulant, and if the doctor is not at hand an injection of ether may be administered.* Apply hot fomentations very lightly over the region of the heart, surround the patient with hot bottles, and do all in your power to restore animation, but keep him perfectly quiet.

The most scrupulous watchfulness is necessary during the whole nursing of this disease. The temperature of the room must be 63° to 65°. Diphtheria patients must never be left alone, and during convalescence, when they are walking or—in the case of children—running about, close watch should be kept for the dragging of a foot, which may be the first symptom of fatal paralysis. Those in attendance should gargle their own throats constantly, and avoid taking the patient's breath. If membrane should be coughed on to the nurse's face or eyes, she should at once wash with a strong solution of mercury. She must eat well, and take exercise in the fresh air. The diphtheria germ is

* See Vol. II., p. 205.

often found in the throats of healthy persons who have had no attack of diphtheria, if they are exposed to the infection.

Special care should characterise the after-disinfection, as the germs of diphtheria are hard to kill, and patients must be completely isolated till a swab passed over the throat shows no trace of the poison. They must be kept flat in bed for at least three weeks, however mild the case. Steam kettles are much used, and always in tracheotomy cases. All milk and water given to a diphtheria patient should be boiled.

TYPHOID OR ENTERIC FEVER

Typhoid fever is so called because it has some resemblance to typhus, with which it used to be confused. It is also styled gastric fever, a term which is sometimes, however, applied to bad cases of gastric catarrh. The incubation period is from seven to twenty-one days, but is usually about fourteen days. The infection is spread entirely by the discharges from the bowels, and (possibly) the urine. The excreta may dry and get into the air, and also into water and milk. Those in attendance on the sick seldom take the disease if precautions are observed, but carelessness on their part may communicate it to others.

Symptoms.—The invasion is very insidious. The patient feels out of sorts, may have bleeding from the nose, pains in the limbs, constant headache, and gradually increasing feverishness, but the pulse is relatively much slower than in the other fevers. During the first week the patient often goes about; in the second week the condition becomes worse, and the rash appears in little red spots which come out in crops and disappear on pressure, and usually occur on the abdomen and legs. (Plate LIII. Fig. 3.) The third week is the worst, the patient then becoming more exhausted, and frequently having delirium. The tongue is parched, and the mouth and teeth need constant attention and cleaning. In the first week the temperature may go up to 103° or 104° ; in the second week to 104° or 105° . In the fourth week convalescence sets in, as a rule, though in some cases the fever does not begin to subside until the fifth or sixth week. Signs of a fatal termination are rapid pulse, difficult breathing, unconsciousness, and clammy perspiration. In something like 10 per cent. of the cases relapses occur a week or ten days after the fever has subsided, and there may be a second, third, or even fourth relapse.

Nursing points.—The patient must not be raised, but his position

should frequently be changed from side to side to prevent bed-sores. As infection is spread by the evacuations, they should be passed into a bed-pan with some disinfectant in it, and allowed to remain standing in strong carbolic for at least ten minutes before being emptied into the public drain. If there is no drainage, they should be buried very deeply, not near a water supply or a dwelling. Soiled sheets should be cleansed at once, and soaked in a strong disinfectant. Great care should be taken by the nurse to scrub and cleanse her hands thoroughly, and also to change her apron, before taking food. The patient should be sponged from head to foot at least once in twelve hours; night-dress and bed clothes should be frequently changed. The room should be well ventilated and kept at a temperature of about 60°.

The *diet* is of extreme importance. During an attack of typhoid little ulcers form on the inner coat of the small bowel; these may eat into a blood vessel, causing hæmorrhage; they also slough, and are very tender, and only liquid food must be given for fear of irritating them. For the first three weeks the diet must be of an entirely liquid character. Error in this may cause a relapse and death, even in advanced convalescence. Milk will be given freely, diluted if there is any sign of its being imperfectly digested, and always boiled. Plenty of water, also boiled, sometimes as much as five pints in twenty-four hours, chicken tea, and beef-tea (where there is no diarrhœa), should be given. Plasmon, switched eggs, Benger's Food, and arrowroot may also be given. No solid food should be allowed for at least six days after the temperature has fallen to normal, and then only in small quantity, and all passed through a sieve. No red meat will be given—only chicken, rabbit, fish—and all crusts must be cut off bread for many weeks after the acute attack is over.

Either constipation or diarrhœa may be present; starch enemata may be ordered for the latter. Aperients must never be given without the doctor's orders; great care is also necessary in the administration of an enemata. The stools of the patient are light in colour, and are often said to resemble pea soup. Medical authorities are not agreed as to how long the infection lasts, but it has been known to extend over months after the patient is apparently well. Separate utensils and lavatory accommodation must be kept for the patient's use for some weeks after he appears perfectly well.

Complications.—*Internal hæmorrhage* may occur at any time from

an ulcer eating its way into a blood vessel. The signs of hæmorrhage are: fall of temperature, rise of pulse, sighing respiration, extreme pallor, and great prostration. The remedies are ice, turpentine capsules, or enemata, but no stimulants, and of course the doctor should be sent for at once.

Perforation of the bowel may occur, and is fatal, unless in rare cases, when an immediate operation is successful. The signs of perforation are these: the patient complains of feeling as if something had given way, great abdominal pain is present, there is vomiting, which has a fæcal odour, and the pulse is rapid and weak. Death ensues very rapidly.

Yet another complication is *peritonitis*, indicated by extreme abdominal pain, rapid and thready pulse, swollen and tender abdomen. A cradle to keep off the weight of the bed-clothes is needful, and a pillow under the knees is often a relief. The vomit in peritonitis is first green, and then like coffee grounds. If poultices are ordered, they must be extremely light—often vaseline spread on muslin with a few drops of opium mixed with it is the only thing that can be borne as an application. The nurse should watch carefully for any swelling of the legs; when this occurs the limb should be wrapped in cotton wool.

The temperature in typhoid shows a great remission between morning and evening. The fever declines not by crisis, but by lysis; that is, the temperature falls gradually. If at any time during convalescence it goes up suddenly there must be an immediate return to liquid diet. The delirium of typhoid is less violent than that of typhus, but the patient needs careful watching.

After-disinfection must be thorough for patient, room and nurse.

TYPHUS FEVER

This affection, known also as jail fever or plague, is most prevalent in dirty and over-crowded places. The contagion is very powerful, and nurses and doctors often take the disease. Fresh air is the best antidote. Infection is spread by exhalations from the body. The incubation period is from five to fourteen days; quarantine, sixteen days. The germ to which the disease is believed to be due has not yet been clearly identified.

Symptoms.—The invasion is severe, and marked by a severe shiver, high temperature, backache, and symptoms of extreme illness. The

tongue is dry and brown, and the lips become quickly covered with what are known as sordes. The rash comes out on the fourth or fifth day, and very much resembles that of measles. Severe delirium is usually present. The temperature remains high all the time of the disease, and there is very little remission between morning and evening. The pulse is also much quicker than in typhoid. In the second week of the disease there is almost constant delirium. The temperature falls on the fifteenth or twenty-first day, and does not rise again, and recovery is rapid.

The complications of typhus, which it is the business of good nursing to guard against, as far as possible, are bronchitis and pneumonia. The latter is usually fatal in alcoholic cases.

Nursing points.—Keep the sick-room very airy, the windows always open. The bed-clothes should be light and warm. Sponge the patient frequently, if possible every four hours, with some disinfectant. In well-nursed cases of typhus the characteristic mousy odour is seldom observed after the sponging begins. Feed well and frequently with beef-tea, eggs, milk, and plenty of water. Mental weakness sometimes follows a severe attack, but does not last long. Ice may be applied for the relief of headache. The nurse should carry out strictly the rules for disinfection and the precautions to prevent the spread of the disease. The door should be covered with a carbolic sheet, and isolation and quarantine of all contacts strictly observed. Although after the temperature falls the patient quickly mends, he must not be exposed to chill or damp, and three or four weeks from the crisis should elapse before he is allowed to come into contact with other people. The brain being much affected in this disease, violent delirium, known as delirium ferox, is a frequent symptom. There is also a condition called coma vigil; the patient may lie for two or three days with his eyes wide open, quite sensible all the time. The urine is often passed involuntarily. Bed-sores come easily with careless nursing.

If the temperature remains high after the fifteenth or twentieth day, the presence of some chest complication is indicated.

SMALLPOX (VARIOLA)

The period of incubation is from twelve to fourteen days. The quarantine for contacts is sixteen days, or till fresh vaccination has "taken." The infective period from the commencement of incubation until all scabs and desquamations and discharges have disappeared, is



PLATE LIV.—ERUPTIONS OF (1) CHICKEN-POX, (2) SMALLPOX ON FIRST DAY OF ERUPTION, (3) SMALLPOX ON FIFTH DAY.

usually from six to eight, or even nine weeks. The infection is spread by contact with the patient, and by the air from an infected room, and can be carried by a third person, as in scarlet fever. It is very powerful and tenacious, and great precaution as to isolation of patients and their attendants is necessary. It is not sufficient to nurse a case of smallpox in one room in a house where others are; the only safety lies in removing the patient to hospital.

Symptoms.—The invasion is marked by a severe shiver, headache, backache, extreme feverishness, and sometimes, in bad cases, an initial rash, seen chiefly on the abdomen and thighs, and somewhat resembling the rash of measles. The characteristic spots (Plate LIV.) appear on the third or fourth day, at first like red pimples; the fever then decreases rapidly, and the spots become vesicular. It should be mentioned that before the spots come out a hard shotty sensation, as of little peas under the skin, can be felt by passing the finger over the forehead and face.

The eruption is fully out by the eighth day, when the pustular stage commences, accompanied by a fresh attack of fever. The spots become full of matter. In a mild case, which is known as discrete smallpox, the spots are isolated, but in a severe case they are confluent—that is, they run together, and very often form one large blister. Great delirium is present at this stage, and there is swelling of the whole face and body. The appearance of a patient during this second week of a severe attack of smallpox is distressing, and it is impossible to recognise the features.

Varieties.—There are three kinds of smallpox: (1) Modified smallpox, or varioloid, which attacks vaccinated people. In this there are few pimples, which dry up and disappear, or may turn into blisters, but there are no pustules. Not less care must be taken in a mild than in a severe case to secure isolation and disinfection, for the former is quite as dangerous to others as the latter.

(2) Confluent smallpox is more serious than the modified form, and the death-rate is higher—about 50 per cent. The fever at the commencement is more severe. The throat and eyes and even the inside of the mouth are much affected, and the secondary fever is very much more severe than in the varioloid form.

In both of these forms of the disease the spots, after having been filled with matter, dry up and fall off, as scales, which become scars.

The worst form of the disease is (3) malignant or black smallpox. The spots, instead of filling with serum, are filled with blood. Hæmorrhage also occurs from the eyes, throat, nose, gums, and in fact from all organs. The patient usually dies before the end of the first week.

Complications.—The complications of smallpox are similar to those of measles, and include laryngitis, bronchitis, and pneumonia. The eyes are affected, and ulcers often occur ; abscesses, erysipelas, and great general debility are very common.

Nursing points.—The nursing of this, as of the other fevers, is of great importance. No one should be allowed to go near a case of smallpox unless she has been re-vaccinated within three years. The patient if possible must be in an isolated building. Any doors or passages connecting with other rooms should be covered with a carbolic sheet. The patient's eyes should be shaded from the light ; often they are bandaged with cold compresses. The skin must be carefully watched and not irritated. An ointment is usually painted over the exposed parts to allay irritation, prevent pain and loosen the scabs. As in chicken-pox, washing of the skin is to be avoided ; when the condition of the patient allows it, a warm bath, as soon as the scabs begin to dry up, is often a great relief.

Diet.—Abundance of nourishment will be given, and given frequently—beef-tea, eggs, and everything that is strengthening—and when the temperature falls, and the secondary fever is over, a strong nourishing solid diet is needful. Meat may be given early in convalescence. Good food will often prevent the most troublesome sequelæ—boils and abscesses.

The odour from a case of smallpox is very disagreeable, and it is well to have a spray with some deodorizer constantly going. The bed-clothes and the patient's linen must be frequently changed, and at once placed in strong disinfectant. It should be remembered that in a severe case the discharges from the bowels, ears, eyes and nose all contain matter, and are extremely infectious ; they should, therefore, be treated in the same way as those of an enteric patient. The back and limbs of the patient need careful watching ; cotton must be worn next the skin, and good woollen garments over it. The exposed parts of the body often need compresses and simple surgical dressings ; the hands and feet are frequently swollen and tender. The spots over the back are very

apt to become bed-sores if care is not taken. Water beds and pillows may be used to prevent pressure. Careful watch must be kept for violent delirium, and the atmosphere of the room must be kept warm and dry because of the danger of lung complications.

The nursing of chest complications needs great skill, as often poultices cannot be used, because of the severe rash. The throat requires much attention. Gargling with boric acid and Condy's fluid is necessary, and spraying and syringing of the nostrils are often ordered.

The nursing of smallpox comes only second to that of enteric fever in its great interest and its demand for skill. The isolation makes the work extremely trying, and the patient at the worst stage needs the most tender and unselfish care, as, owing to his appearance, and the odour, the work is the reverse of pleasant. It is difficult often for the nurse to retain her appetite in these circumstances. She must eat as far from the infected room as possible.

Desquamation is a most tedious process. The feet are the most difficult parts to deal with, and great care should be taken not to pull the skin off, as very troublesome sores may result. During the acute stage of the disease the patient's hands should be tied up in bandages, and at all times watch must be kept, especially in children, to prevent rubbing and irritation of the blisters. Careful nursing and watchfulness in this respect will often prevent a patient from being marked.

The after-disinfection of a building in which a case of smallpox has been nursed must be very thoroughly carried out. After an epidemic, if sheds have been used, they are often burned, which is the safest plan. A nurse must not think that because a building is set apart and kept entirely for smallpox her responsibility as to disinfection is at all lessened. On the conclusion of a case, when her patient has been disinfected and discharged, she must not leave the building until it has been made, as far as she can make it, safe for anybody to enter.

CEREBRO-SPINAL FEVER

This disease, also called epidemic meningitis, and spotted fever, is seldom seen in this country, but of late years there have been epidemics in Edinburgh, Glasgow, Belfast, and other parts of the country. It comes in epidemics, much in the same way as does typhus. It is believed to be due to a diplococcus, but the means by which infection is communicated are not yet known.

The **symptoms** are pains in the back, shivering, high fever, and sometimes vomiting; acute headache, chiefly at the back of the head, excessive tenderness all over the body, and stiffness at the back of the neck, as in meningitis; the muscles of the neck and back grow hard and rigid, the head is retracted, the back arched, the pain intense. There is usually delirium, which may be violent, and may end in coma and death. If the patient recovers, he will be very emaciated, and convalescence is a slow process. Sometimes there is an eruption of blood spots; hence the name "spotted fever." Emaciation and mental incapacity are usually the sequelæ.

Nursing points.—The nursing is disheartening, as comparatively few patients recover. As in the other fevers, the doctor depends very much on the work of the nurse. A very common treatment, and one which can be counted on to give relief, is a hot bath; patients sometimes have at least three hot baths in the twenty-four hours, which makes the nursing very heavy, but the restlessness of the patient ceases for three or four or even more hours after each bath. Children cry when they are removed from the bath, in which they are kept from five to twenty minutes, being rubbed down afterwards with a hot towel. The bath should be as hot as is safe, like those used for convulsions, and it must be kept hot while the patient is in it. Patients affected with this disease are most susceptible to cold, and extra blankets and hot bottles are useful, as they suffer less if warm. Constant pain in the back and the head is present. There is sometimes difficulty in swallowing; in such cases feeding with a nasal tube is useful. Vomiting is a frequent symptom. The diet should be light, nourishing, and large in quantity; in some cases full diet can be taken quite well. The patient in a prolonged case wastes rapidly, and bed-sores must be looked out for, and treated in the usual way if they occur, but blisters turning into sores just like bed-sores occur spontaneously sometimes, at points where there is no pressure; these should be reported to the doctor at once. Great care must be taken as to the use of hot bottles.

Complications.—*Conjunctivitis* and *discharge from the eyes* are common, and the same precautions against this complication should be observed as in measles, the eyes being regularly bathed, etc. Care should be taken to note whether the patient appears to be blind or deaf, and if a convulsion appears it is useful to note what parts are

affected by the twitching, and which limbs first. It is in little points like this that a good nurse can be of great assistance to the doctor.

Lumbar puncture is performed both in diagnosis and in treatment. The patient's back, commencing from the pelvis to about six inches up the spinal column, is prepared as for a surgical operation. Test tubes and needles must all be boiled, and the latter plugged with clean cotton wool. A flat hot basin for warming the bottles of serum, and of the antiseptic which the doctors may afterwards inject, is useful. Some medical men inject the fluid under the skin, as in diphtheria. In acute cases careful watch must be kept for any reduction of urine.

There is no reason to believe that the disease is directly infectious from patient to nurse. The infection, however, may be carried in the nose and throat of healthy persons who have been in contact with the disease, and these may give it to a third person without having it themselves; nurses therefore should gargle their throats constantly. Medical authorities are satisfied that the infection is found in the nasal and eye discharges of the patient.

Extreme care must be taken as to the after-disinfection of patient, nurse, and room.

INFLUENZA

“La grippe,” as it is sometimes called, is an infectious fever which often appears in the form of an epidemic. It is frequently rife in the early spring. It goes through the various stages which characterise other infectious fevers. The period of incubation is under a week, usually one to two days. The infective period is from the commencement of the invasion till after convalescence has been well established. The infection is spread by contact with the patient, and breathing the air of the infected room. Isolation of patient and nurse, and thorough disinfection of the room and all in it, are necessary.

Symptoms.—The symptoms of influenza vary considerably, both in character and in intensity, but usually the invasion is marked by general malaise, severe headache, pain in the eyes, bruised feeling all over the body, and catarrh, accompanied by fever. A hard, dry cough, like that of measles, may be present. The form the influenza takes varies in different epidemics; at one time it affects the lungs, at another the throat, at another the digestive organs, and so forth, and however mild the attack, the complications and sequelæ may both be severe and dangerous. The heart may be much affected, there is almost

invariably great prostration, and the nursing must be careful and thorough.

Nursing points.—The patient should be kept strictly in bed for a week after the temperature has become normal. During the early stage of the disease light nourishing fluid diet must be given. Headache is often severe, and extreme pain in the eyes may necessitate the patient being kept quiet and in a darkened room. The bed-clothes, and those of the patient, must be light and warm. Sometimes profuse perspiration occurs, and the same care should be taken as in nursing a case of rheumatic fever; the limbs may be wrapped in cotton-wool and bandaged. Nourishment and stimulants are of great importance; strong beef-tea, eggs, custard, and soups of all kinds will be given. Any chill should be carefully avoided, and the great point is to keep the patient in bed for as long as possible. Relapse often occurs, and may prove fatal.

Possible complications are pneumonia, bronchitis, insomnia, and very often great mental depression. Delusions may be a troublesome sequelæ. Thorough disinfection of sick-room and clothing should be carried out.

∴ The writer of this chapter begs to acknowledge her indebtedness to Dr. Ker, of the Edinburgh City Hospital, for much-appreciated help.

CHAPTER XXV
THE NURSING OF TROPICAL DISEASES
BY ALICE MARY HALL

Dysentery—Cholera—Plague—Yellow Fever—Blackwater Fever—Sprue—Beriberi
—Leprosy—Malaria—Liver Abscess.

THERE is no branch of nursing where the skill of the well-trained nurse is more serviceable than in the various affections which are called tropical diseases, understanding that phrase in the sense in which it is interpreted by Sir Patrick Manson, as indicating "diseases occurring only, or which from one circumstance or another are specially prevalent, in warm climates."* I need only further say, by way of prologue, that nurses who have had the privilege of working with and for Sir Patrick Manson will never cease to appreciate the opportunities afforded them of adding to their general training an insight into this special group of diseases.

DYSENTERY

Dysentery may be of three main types—(1) bacterial, (2) protozoal, (3) verminous. The only thing that appears to be certainly known about the transmission of the disease is that in many instances it is water-borne. It is held to be quite possible, however, that privies, dust, flies, fouled vegetables, and vessels used by patients play a part also in its dissemination. A low state of vitality acts as a predisposing cause.

Symptoms.—Dysentery in ordinary cases is an inflammation of the mucous membrane of the colon (large intestine) causing acute pain in the abdomen, straining, frequency of stools, sweating, loss of flesh, and restlessness.

Nursing points.—The patient should be put to bed at once, kept warm, quiet, and have entire rest, and great care must be given to diet ;

* "Tropical Diseases." By Sir Patrick Manson, K.C.M.G., M.D., LL.D., F.R.S. 4th edition. 1907.

the necessary drugs will be ordered by the physician. In the acute form the dysenteric patient complains continually of great thirst, and as the diet (which is fluid) should be given in very small quantities and at regular intervals, it is often found difficult to make him contented; but this discomfort can be somewhat relieved by the patient rinsing his mouth frequently with a little warm water, or sucking small pieces of ice. Hot fomentations should be applied to the abdomen during the attacks of pain. The temperature, pulse, and respiration should be taken every four hours (although it is seldom there is a rise of temperature); usually it is found to be subnormal, and even lower, which makes it important that the extremities of the patient be kept warm by hot bottles, and a warm blanket placed next him. All stools should be carefully inspected, for they vary very much in character as the disease advances or improves. In chronic dysentery they are of many different kinds; most often they are found thin and watery, sometimes very offensive and intermixed with blood, mucus, and pus. Great care should be taken that the patient has food which he can digest.

During the early stages of illness, albumen water, rice water, barley water, white wine whey, white meat soup, raw meat juice, and peptonised milk may be ordered, but it is most important that the food given be warm (that is, neither hot nor cold). In cases of extreme weakness stimulants may be prescribed. As the general condition improves, arrowroot, Benger's food, junket, and other light and digestible foods may be given; but no solid food should be allowed for some days after all signs of the illness have ceased.

In chronic cases the diet is more liberal, as the patient becomes weak and anæmic from the prolonged attack; boiled fish, pounded chicken, or pounded fresh meat, strong soups, and egg-flip, will be found beneficial; but the nurse must still exercise great care and watchfulness to see that the nourishment taken is properly digested. A patient with chronic dysentery need not be kept in bed all day, but should be lightly and warmly clothed, and have plenty of fresh air and amusement, as there is a tendency to much depression of spirits and languor with those chronically ill.

For the safety of others and of herself, the nurse should be careful thoroughly to disinfect the stools before they are disposed of, and all utensils used by the patient should be marked and set apart for him. The bedding and linen must be fumigated after use.

The complications to be watched for are hæmorrhage, collapse, perforation,* and delirium.

CHOLERA

This is an acute infectious epidemic disease; the incubation period varies from a few hours to three days. It is generally held to be caused by the comma bacillus, so called from its resemblance to a comma. For the most part, it is a water-borne disease. Swallowed by man, it is discharged in the excreta, finds its way to water again, and continues to multiply.

Symptoms.—Cholera often begins with diarrhœa, which after a day or two develops into the more serious malady. Or the first symptoms may be a single copious loose stool, followed frequently by others, at first stained with bile, then thin and colourless like rice water, containing small white flocculi and void of smell. Severe vomiting follows; the vomit may at first contain a large amount of food, but afterwards is a fluid like rice water, resembling that passed through the intestine. The abdomen and extremities are attacked by agonising cramp, from which the patient may quickly pass into a state of collapse; the cheeks fall in, the nose becomes pinched, the eyes sunken, and the skin blue, the tongue looks like a piece of lead, the voice is reduced to a whisper, and the body is covered with a cold, clammy sweat. The respirations are shallow and rapid, and the breath cold; there is suppression of urine and bile; the pulse becomes thready and rapid and scarcely perceptible, and may disappear entirely at the wrist; the temperature in the axilla may register 92° , while that in the rectum may be as high as 102° to 105° . The patient is restless, and complains of intense thirst and of a burning feeling in the chest, and is racked with cramp. The mind may remain clear, or the sufferer may wander or pass into a comatose state, which terminates either in death, rapid convalescence, or secondary fever.

Nursing points.—The patient must be kept quiet and strictly in the horizontal position in a warm bed in a well-ventilated room. The surface of the body must be wiped with warm dry towels to keep it dry, and great care should be taken to maintain warmth in the extremities by means of hot bottles and blankets. The patient must have complete rest, and not be raised more than is absolutely necessary. It is advisable to use a slipper bed-pan, which should be warmed before being

* See *ante*, p. 111.

applied to the patient. During the active stage of the disease no food will be allowed, but in extreme exhaustion brandy may be given by the mouth, or if there is vomiting, the doctor may order hypodermic injections of brandy or ether. Should the patient show no sign of improvement, intravenous or subcutaneous injection of saline fluid (60 grains of common salt, 60 grains of carbonate of soda, to one quart of sterilised water at 100° F.) may be resorted to, from one to three quarts being injected. This will, as a rule, quickly restore the pulse, and it may be the means of saving life. In the reactionary stage, if purging continues, the physician may order drugs to be given, either by mouth or *per rectum*. Hot fomentations, hot poultices, and dry cupping over the loins should be employed if the secretion of urine is not quickly restored (one must carefully watch for retention and, if necessary, use the catheter). Should there be constipation, simple enemata only are given. During convalescence the diet must be simple and easy of digestion, such as diluted milk with barley water or rice water, thin broth and meat juice, albumen water, white wine whey; and the return to ordinary food must be marked by great care.

As the infection of cholera is in the stools, nurses should be most careful that these are thoroughly disinfected, and that every possible care is taken to protect the community at large and to guard her own safety. Anything wet should be suspected; *all* water and milk should be boiled before use; strong disinfection must be employed before and after use of the bed-pan; all articles for the patient's use should be plainly marked and kept apart. The linen and bedding should be carefully fumigated.

PLAGUE

is a disease which has been traced as far back as the second century B.C. In 1665 it visited England for the last time, and during one year 70,000 inhabitants of London perished. It is a specific infectious disease, characterised by fever and buboes, and caused by the *Bacillus pestis*, which is found in the lymphatic glands, viscera, and blood. The disease is brought to healthy localities by infected rats, infected food, infected clothes, and also by human agencies. Since 1896 there have been many outbreaks in India, especially among the rude hill people, for the disease runs riot in filthy and overcrowded districts. The incubation period may vary from a few hours to two, five, eight, or even fifteen days.

Symptoms.—The illness sets in generally with a chilliness, sometimes with a rigor (this rarely). There are rise of temperature, headache, aching of limbs, and drowsiness, the features become haggard and drawn, the eyes sunken and bloodshot, the tongue covered with a white, creamy fur, and the teeth coated with sordes; there are intense thirst and extreme prostration, retention of urine, and vomiting, and there may be either diarrhœa or constipation. The patient has a peculiar, hesitating speech, and the mental condition is confused. During the time of fever the temperature rises to 103° or 104° , or may even reach 107° .

In the bubonic type, to which at least two-thirds of the cases conform, the characteristic glandular swelling or swellings develop, generally within twenty-four hours, though they may not appear for several days. They are generally found in the right groin, very seldom in the left, occasionally in both, but they may appear in the axilla, and in children the glands at the angle of the lower jaw are most often affected. They are usually single, but may form on both sides of the body.

Nursing points.—A plague patient should at once be isolated, and all utensils for his use must be carefully marked and set apart. The temperature, pulse, and respiration are taken every four hours, and the urine passed in the twenty-four hours should also be noted and measured.

During the early stage, ice to the head and neck may relieve the headache. Where there is fever tepid sponging is refreshing and may reduce the temperature and induce sleep. A mustard plaster to the epigastrium may help to relieve the vomiting. In time of extreme exhaustion and collapse, strychnine and stimulants may be ordered by the physician, given either by mouth or hypodermically. To relieve suffering and procure sleep morphia, hyoscine, chloral, or bromide of potassium may be ordered. If so, the effect should be carefully noted, and the patient kept warm with hot bottles and blankets. In cases of severe diarrhœa, intestinal antiseptics may be prescribed. Before the bubo is fully developed, belladonna and glycerine may be applied; when it is inflamed, hot fomentations, and finally an incision is made, and the wound cleansed and packed with iodoform emulsion.

The patient should be fed at regular intervals with a light digestible diet. The nurse should first be inoculated, and should take daily regular out-door exercise, not remaining too many hours in the ward at a time. Her face and hands should be washed before meals, and a disinfectant

mouth wash used frequently, especially before taking food, and in no circumstances must she eat in the sick-room. An overall and rubber gloves should be worn while attending to the patient, and all unnecessary contact with him avoided. She should take every care to protect her hands, and any cuts or scratches should be at once covered with a sealed dressing.

The patient's room should be large and well ventilated, and washed over each day with a disinfectant (1 in 20 carbolic, or lysol). A disinfectant should be put into the bed-pan before and after use, and in the case of all excreta from the patient there must be a free use of disinfectants. Infected linen and bedding should be burnt, and the room carefully and thoroughly fumigated.

YELLOW FEVER

Yellow fever is an acute and fatal disease, caused by a specific organism which has not yet been definitely discovered, but which is transmitted to the human being by the bite of an infected mosquito in the same way as malaria. The disease occurs as an epidemic on the west coast of Africa, and in the endemic form in the West Indies. Its area is limited. It is most likely to occur in a temperature of 72° F. and during a rainy and damp season; in cold and frosty weather it is hardly ever found. The period of incubation may vary from one to five days, occasionally longer.

Symptoms.—The patient is suddenly attacked with intense headache, accompanied with rigors or chilliness. There is a rapid rise of temperature, with most distressing pains in the lumbar region of the back and pain and aching in the backs of the legs and round the ankles. The face is flushed and swollen, the eyes become ferrety in expression, the skin dry. The patient is sometimes jaundiced, and has pain with tenderness in the region of the epigastrium. There is general irritability and restlessness as the febrile stage advances. The pulse-rate rises from 100 to 130, the beat is full and strong, the thermometer registers 100° to 104°, and may reach 107°, rising rapidly to the maximum. On the first, second, or third day, or very often within twenty-four hours of the onset of the fever, the temperature becomes normal, with an occasional slight rise after three or four days. As the disease progresses, the pulse becomes extremely slow and compressible, the beat being only 30 to 40 a minute. The tongue is covered with a white coating, but instead of becoming swollen and flabby as in many fevers, it is small

and pointed throughout the disease. Later on it becomes dry, and there is an unquenchable thirst, the gums swell and bleed, and as day by day the patient loses strength, the face becomes shrunk and thin and the eyes sunken. In some cases the skin is hot and dry, or the body may be covered with perspiration from time to time, and in a case of extreme prostration and collapse the sweating may be continuous.

At the end of the first stage, the skin of the patient generally becomes yellow, from which the disease obtains its name. This yellowness often remains for some time after convalescence. There is albumen in the urine, with a tendency to suppression; in severe cases only a few ounces of urine may be passed in the twenty-four hours, containing albumen in the proportion of one-half or two-thirds. Diarrhœa follows constipation and vomiting, and in the greater number of cases the vomit is black. Pure blood is sometimes thrown up from the stomach, and hæmorrhage may occur from the nose, mouth, ears, eyelids, throat, gums, bladder, uterus and cutaneous tissues.

Delirium may be present, or the patient may become torpid and in severe cases comatose, a condition followed by twitching and convulsions, and ending in death, which may occur during an early acute stage, preceded by a rapid rise of temperature.

Nursing points.—In yellow fever the nursing of the patient is of the utmost importance, and doctors readily recognise that the treatment is more a matter of nursing than anything else. The patient must at once be isolated and kept in bed, and it is well to remember that the mildest form of yellow fever is quite as dangerous in spreading the disease as a more severe attack. At the beginning of the fever a purgative may be ordered, such as a large dose of castor oil, saline, or calomel, but none will be given after the second day.

To relieve the intense headache and cerebral congestion, hot mustard foot-baths are recommended during the first twenty-four hours. Congestion of the stomach is frequently a feature of the disease, and mustard poultices on the epigastrium, or hot baths, the patient being enveloped in hot blankets afterwards, tend to give some relief. When the temperature runs very high, drugs, cold baths, cold sponging, cold packs, and iced water enemata may be found most beneficial, but these forms of treatment must be carried out most carefully and with as little exertion to the patient as possible. The vomiting may be allayed by giving him ice, or small doses of cocaine, or by a mustard plaster over the epigastric

region. Styptics are usually given to check the black vomiting, and pilocarpine when the skin is not acting and there is only a small amount of urine passed in the twenty-four hours.

Stimulants are considered necessary after the fourth or fifth day, when the circulation begins to fail. Champagne, hock, or brandy, in drachm doses every half-hour, will help the patient, but should the vomiting increase, such treatment as this will be stopped. The patient is really better without food during the first two or three days. After this feeding is a very important matter, for when there is no longer fever, the patient craves for food and the nurse must exercise much tact and the greatest care, only the lightest possible fluid diet being allowed, such as iced milk, chicken tea, and albumen water, and these given in drachm doses only.

As the patient's health improves, the quantity will be increased gradually until he is convalescent, but even then only the simplest and most digestible food is given. Indiscretion in diet may cause a relapse, which in yellow fever is extremely dangerous and often fatal.

In any town or locality where yellow fever may appear, all sanitary conditions should be most carefully inspected, no overcrowding should be allowed, and absolute cleanliness must be most rigidly maintained. It is safer in visiting to avoid the low-lying districts.

While nursing a patient with yellow fever, the nurse must attend very carefully to her own health, must avoid over-fatigue and anxiety, and take regular out-door exercise, sufficient rest and good plain food. She must never take a meal in the patient's room. An overall should be worn while attending to the patient. All articles used by or for him should be marked and kept apart. Disinfectants, such as carbolic (1 in 20) or lysol, should be plentifully used for all excreta from the patient.

Sweeping and dusting should be done with a duster wrung out of carbolic (1 in 20) or some other disinfectant. By way of after-disinfection, the clothes, bedding, and linen should be destroyed by burning, and the room thoroughly fumigated for at least twenty-four hours.

BLACKWATER FEVER

Hæmoglobinuric or blackwater fever is a most dangerous disease, prevalent in various parts of tropical Africa, India, America, and the East and West Indies; it is specially rife in the more malarially

infected districts. It is characterised by an immense and rapid destruction of the red corpuscles of the blood, and is one of the worst complications of malaria. The affection derives its name from the colour of the urine passed. Its onset generally occurs after occasional attacks of malarial fever, as the result of which the patient becomes extremely anæmic and in a thoroughly bad condition of health. It is believed by some to be due to a micro-organism, but other authorities hold it to be caused by quinine.

Symptoms.—The chief symptoms are fever, rigors, severe vomiting, jaundice, and hæmoglobinuria. The rise of temperature is irregular, and sooner or later in the attack the patient will complain of severe pains in the loins and over the hepatic region. An hour or two afterwards the dark-coloured water is passed; after which the fever may continue for a few days. There will be pain over the epigastrium, much vomiting, diarrhœa or constipation may be troublesome, and the pain in loins and liver still continues, with depression of spirits and great restlessness. The urine becomes darker, and there is profuse sweating, during which the temperature falls and the amount of urine passed is much greater, and as it gradually clears and the quantity passed diminishes, the normal colour returns. In a very acute attack the urine becomes thick and sticky, like black treacle; after the first or second day of the fever it begins to clear, but the quantity passed becomes less and less, until there is complete suppression. In this stage the patient may die of coma, sudden heart failure, or uræmic convulsions.

As the illness develops the skin varies in shade, from dark saffron colour to the yellow usually seen in a mild attack of jaundice. The patient is conscious of a feeling of extreme weakness after the fever has left him, and gains strength very slowly. The day after the fever subsides it may recur, and this recurrence may take place several days in succession, or not at all. With a further rise of temperature the hæmoglobinuria may return.

Nursing points.—The nurse must gain the confidence of her patient, and great care must be exercised in keeping him in bed, and maintaining warmth with hot bottles and blankets. The room should be well ventilated, and kept at a temperature of 65° to 68° F. The temperature, pulse, and respiration should be charted every four hours, and the amount of urine passed must be recorded, and a daily (twenty-four hours') specimen saved for testing. It is a good rule to re-fill the hot bottles regularly

every four hours, as this keeps the patient's body at an equal heat day and night. It will refresh him to be sponged all over with warm water night and morning, and during the day to bathe his hands and face with warm water to which a little eau de Cologne or toilet vinegar has been added. As saline injections may be ordered, the nurse should have sterilised water and a solution of saline (1 drachm to the pint) in readiness.

The medicines, the specimen urine, and the temperature chart should all be kept out of the patient's sight, and on no account must the nurse allow him to get out of bed without the physician's orders, nor should he even sit up until he has been able to retain and assimilate food. Any extra exertion might cause sudden heart failure and death. The nurse must always bear in mind the seriousness of the complaint, and a well-trained, thoroughly conscientious woman can be of the greatest value in helping towards her patient's recovery, for, as in enteric and yellow fever and pneumonia, the issue depends more on the careful nursing of the patient than on drugs.

There is often great difficulty in the feeding of the patient, and every care must be given not to attempt to feed by the mouth while there is continued vomiting. The patient may be fed with nutrient enemata or nutrient suppositories, which would be given under medical directions, either four-hourly or six-hourly. The rectum should be washed out carefully once in the twenty-four hours with warm sterilised water. When food can be taken by the mouth, it must be in fluid form and easy of digestion, commencing with drachm feeds hourly, the quantity being increased (if the vomiting ceases) to 3 pints in the twenty-four hours, administered in 5-ounce feeds every two hours.

If milk cannot be properly digested, the physician may order white wine whey, chicken broth, mutton broth, or meat juice. Later, when the patient reaches the stage of early convalescence, essence of mutton, oyster broth, pounded fish or chicken may be given. A more liberal and varied supply of food will be allowed later on, according to the patient's condition.

When he is first allowed to sit out of bed, he must be carefully wrapped up in blankets and the room kept warm. He should not be allowed to stay up long enough to get over-tired. It is better for the first few days to use a couch, and later an armchair, for the patient suffers much from

weakness, and a great deal of careful attention is needed in the early stages of returning strength.

SPRUE (PILOSIS)

Sprue is a disease frequently met with in tropical and sub-tropical climates, and particularly among European residents. It is most prevalent where there is high temperature and a moist atmosphere, such as in the West Indies, Java, and tropical Africa, etc.

Sprue is defined as a chronic catarrhal inflammation of the mucous membrane of the alimentary canal, which generally involves the liver and other digestive organs. In this affection there are alternate periods of an acute and a quiescent stage.

Symptoms.—The tongue becomes inflamed, red, and sore, and extremely painful. The mucous lining of the lips, internal surfaces of the cheeks, palate, and gullet may also become very irritable and inflamed. There is flatulency from the disordered digestion, and the stools are generally loose, large, and of a pale, frothy, and fermenting character. There is also a considerable tendency to anæmia, and the patient loses flesh and weight rapidly. The symptoms vary much according to the general condition of the patient when he contracts the illness. It may follow an attack of gastro-enteritis, acute gastric disturbance, or dysentery, and may run its course in a year or two, or drag on for ten to fifteen years. Usually, to start with, the patient will complain of feeling very weak and tired, his memory fails him, he has no wish to exert himself, and cannot concentrate his thoughts for any length of time; there are abdominal discomfort and swelling, and generally some diarrhœa; his complexion becomes dark and muddy, and there is great irritability of temper; vomiting may sometimes be present, and there is great distension after taking food.

The stools in a chronic case of sprue are large, pale, of a greyish colour, partly fermenting, and have an offensive odour, while in the acute stage they will be watery, pale, and fermenting, and will contain undigested food.

The dyspeptic distension is sometimes much relieved by an attack of diarrhœa. It is often found that a patient may have been troubled for months or even years with irregularity of the bowels, without his general state of health being disturbed. But at last the mouth becomes sore and inflamed, gradually he gets weaker and thinner, the

diarrhœa is more persistent, the appetite varies, there being sometimes a disinclination for food, but more often a hunger which nothing can appease. Excess of food will bring on great discomfort and distension. As the patient gets weaker, he is obliged to remain in the house, and finally to stay in bed, the feet become swollen, there is extreme emaciation, and death ensues from exhaustion. If a case of sprue is treated carefully in the early stages of the disease, there is always a hope of arresting its course. In persons over fifty years of age, or when the disease is of long continuance, and also in those who refuse to take milk and to exercise care, it almost always ends badly. The "milk cure" is held by leading authorities to be the most successful treatment known.

Nursing points.—A patient suffering with sprue must take to his bed, and be kept well warmed with hot bottles and blankets. The temperature of the room should be maintained at 65° to 68°. There should be a flannel binder over the abdomen, and a flannel jacket for the shoulders and arms. Before the milk cure is commenced, the patient will be given an aperient such as castor oil, or rhubarb powder, and until the purgative has acted no food is given; afterwards milk is given punctually in 5-ounce feeds every two hours, and taken very slowly, either with a spoon, through a straw, or, better still, a child's feeding bottle. As the patient's health improves, the quantity of milk is increased by half to one pint every other day, until 5 pints instead of 3 are taken daily. This quantity will be continued for ten days. If the patient continues to do well, the amount is increased to 6 or 7 pints in the twenty-four hours.

The patient may now be allowed up, and if strong enough may spend a good deal of time in the open air, if the weather is suitable and warm. For six weeks after the stools have become solid and the mouth free from irritation, milk only must be taken. A raw egg may afterwards be added to the milk. Malted foods, and gradually arrowroot (well boiled), thin stale bread and butter may be given, and as the patient verges on convalescence, chicken broth, a little fruit, then fish and chicken may be added to the dietary. Every care must be taken in preparing the food, and the nurse must be careful to see if the food is being properly digested.

Should there be the slightest indication of a recurrence of any of the symptoms, the patient must at once be put back to bed. An aperient

is administered, and a return to the milk diet strictly enforced. If it is found that the patient is unable to digest so much as three pints of milk in the twenty-four hours, the quantity will be reduced to about half a pint daily, and gradually increased to one and a half pints, and then by degrees to the full allowance of 6 or 7 pints a day. If milk cannot be properly digested, other food preparations can be tried to make up the amount of nourishment needed, such as koumiss, or white wine whey (which is sometimes digested when milk is not). To half a pint of fresh milk, heated to 100° F., add a wineglass of sherry, and let it stand until it curdles; strain, when it is ready for use. Or raw meat juice, from fresh lean meat, may be tried. When the stools are a little less loose, raw scraped meat, or nearly raw meat, a little very dry toast, rusk, or dry biscuit, may be given.

The "Salisbury cure" consists of lightly-cooked meat, from a few ounces up to 3 lb. a day, and warm water up to four pints, taken morning and night, and about two hours before a meal—never with one.

Fresh strawberries are sometimes given, usually commencing with one strawberry three times a day, and the amount gradually increased until $\frac{3}{4}$ lb. is taken in the twenty-four hours, with regular two-hourly feeds of milk (5 ounces each) up to three pints per diem.

Suppositories or nutrient enemata are often found most useful, and are usually ordered to be given every four hours. The rectum should be washed out once in the twenty-four hours with cold sterilised water.

The utmost care should be taken by the nurse to ensure that the patient never feels cold. When up and about he should be lightly but warmly clad, and even when he is convalescent the temperature of his rooms should be 65° to 68°. All fatigue and over-strain must be avoided, and rest should be taken before the feeling of tiredness comes on. Food must still be given in moderate quantities, and everything possible done to prevent abdominal disturbance. Constipation must be guarded against and, when necessary, a simple enema given.

BERIBERI

Beriberi is a disease mostly found in tropical and sub-tropical climates, but it has also been known in France and Dublin. It may appear as an epidemic, endemic, or sporadic disease. It is believed to be a germ

disease, but is not easily communicated from man to man, and is held to be encouraged by bad feeding, overcrowding, badly ventilated, damply situated, and overheated surroundings. The mortality is great, sometimes very high. The causes of death are paralysis of the heart and œdema of the lungs. The disease is defined as a specific form of multiple peripheral neuritis.

Symptoms.—The onset of beriberi may be either slow or sudden. The patient at the commencement usually shows some signs of depression of spirit, inability to work, loss of appetite, sleeplessness, cramps, dryness of skin; as the disease develops he complains of pain and numbness in hands and feet; there is much tenderness over the surfaces of thighs and backs of the legs. There is also wasting of the muscles, and a good deal of œdema. The patient may recover slowly or rapidly; the disease may last only a few weeks, or may run into years.

Beriberi is found to attack persons between the ages of fifteen and thirty years. Among young children and aged people it is not known. Its outbreaks occur during the hot and rainy season.

Nursing points.—It is necessary that the patient be moved from the place where he contracted the disease to the top room, if possible, of a well-ventilated, dry house; be put to bed in a bright sunny room, and be carefully fed with good food, of which fat should form a great part. In a mild attack of beriberi the patient is generally ordered to take daily exercise, and to spend the day in the open air, but is not allowed to get over-tired or fatigued in any way. But in other cases he must not be suffered to exert himself or even to sit up in bed until the physician has given permission. The nurse must ever bear in mind the danger of the condition of the heart in this complaint, and that death may occur very suddenly from dilatation and failure of that organ, or from asphyxia, produced by œdema of the lungs. As instant measures must be taken when a cardiac attack suddenly develops, the nurse should always have at hand nitrite of amyl capsules, nitro-glycerine tablets, and the oxygen apparatus. Venesection is occasionally performed, eight to ten ounces of blood being taken by the surgeon from the arm or the external jugular vein. In cardiac cases digitalis or strophanthus is ordered, either in small or large doses, according to the condition of the patient, and it may be necessary to repeat the dose every quarter or half hour until the threatening symptoms pass off.

In an acute case of beriberi the patient is allowed very little fluid to drink, so as to reduce the amount of blood in the heart and vessels. The bowels are attended to carefully, and made to move freely every day. The amount of urine passed is diminished—it is generally high coloured, acid, and may or may not contain albumen; the quantity passed in the twenty-four hours should be measured, and a specimen tested daily. The temperature, pulse, and respiration should be taken every four hours, and special attention paid to the character of the pulse. When a patient becomes dropsical or paralysed, scrupulous care must be taken to avoid bed-sores. A water-bed adds greatly to his comfort.

The diet will be light but nourishing. Fresh meat should be given twice daily (but no potatoes), and butter, milk, eggs, wheat flour, and oatmeal are suitable. All kinds of beans are specially good, as they contain a large amount of nitrogenous matter, which must be fully represented in the diet. During the acute stage stimulants may be ordered.

Where there is much atrophy and anæsthesia of the muscles, faradic electricity and massage may be ordered for the affected parts.

After a case of beriberi, all clothing and other articles should be carefully cleansed and the room thoroughly fumigated.

LEPROSY

This is one of the most ancient of diseases, and is thought to have originated in Egypt. It is produced by the *Bacillus lepræ*, a micro-organism closely resembling the tubercle bacillus, and is associated with dirt and poverty. It is a chronic and infective disease, and is characterised by erythematous patches, accompanied with local anæsthesia and ulceration.

The period of incubation varies, and generally lasts from two to three years at least. But for a few small blotches, it may be years before any visible sign of the infection itself appears. In the early days of the disease a patient may, from no apparent cause, be troubled periodically with excessive sweating, either generally over the body and limbs or in localised patches. It is in the later and more advanced stages that the patient becomes disfigured, and gradually loses his sight, hearing, sense of smell, and taste. The eruption usually appears on the face, the extensor surfaces of the limbs, the back of the hands, the back,

buttocks, abdomen, and chest ; it is rarely found on the soles of the feet or the palms of the hands. There may be irregular accessions of temperature, and the patient suffers terribly before the disease advances to the end. Leprosy has been found in the newly born, but it is between the ages of ten and thirty years that most cases occur. The disease usually progresses slowly, and a patient may have suffered from it for thirty or forty years, and finally die of another disease, usually phthisis.

Nursing points.—The patient should be isolated and his rooms be kept scrupulously clean and well ventilated. He should have soap baths and change of underlinen every day. Fresh air and outdoor exercise are most essential, but all fatigue and overstrain should be avoided. The patient should not be exposed to bad weather, and his food should be light but nutritious. Drugs, and dressings for the open wounds, will be ordered by the physician. The nurse should wear an overall and, when dressing the open sores, rubber gloves, which should be sterilised after each time of using. She should take daily outdoor exercise, and not remain longer in the patient's ward than is absolutely necessary. She must attend carefully to her general health, and take her meals apart from the patient.

MALARIA

This terrible disease is most prevalent in India, Africa, and Italy, and is generally associated with swamps and low-lying districts where the average temperature is 60° F. It is an endemic disease, but may become epidemic. Formerly malaria was supposed to be due to exhalations from rank vegetation, but it is now known to be caused by the bite of certain species of mosquitoes, which thus transfer to a human host the malaria parasite, the only connection between the disease and the swamps where it most abounds being that such localities are those in which the mosquitoes breed. Children as well as men and women are liable to it, and in children it is much more dangerous than in adults. In malarial districts the disease is most liable to be contracted just before sunrise and after sunset, these being the times at which the mosquito is most active.

Symptoms.—The incubation period may vary from three to twenty days ; patients suffering from malaria will complain of being tired and feeling faint, and there will be shivering fits, recurring at regular intervals,

usually before noon. If the fit is repeated every day the case is one of *quotidian* ague ; if every second day, *tertian* ; if every third day, *quartan*. The kind of fever, quotidian, tertian, or quartan, depends upon the variety of parasite with which the patient is infected. The cold sensations and cold shivering may become so violent as to constitute a rigor. The onset of the shivering fit is one of the most characteristic features of malarial fever, especially when it recurs at regular intervals, as before mentioned. There is generally headache, which may be severe or otherwise ; nausea and sickness are very often present, with rapid pulse, increased respiration, rise of temperature, pains in the limbs and body. The tongue is frequently furred, the bowels are often constipated, and occasionally diarrhoea may occur ; the lungs and heart are usually normal. The liver is generally found to be enlarged, but less so than the spleen. The amount of urine secreted may increase during the cold stage, and decrease after the sweating stage, and show a high specific gravity. There is seldom albumen or other change in an ordinary case of malarial fever. During an attack the appearance of the patient is very striking—features sunken, nose pinched, lips cyanosed, fingers shrivelled, the whole body shaking violently with ague. The respirations become more laboured and slower. The febrile stage begins with temporary waves of heat, until a sensation of warmth is maintained, the patient then losing to a certain extent his shrunken appearance ; the cyanosis disappears, and now the face becomes flushed, the pulse throbbing, and the headache more severe. The sweating stage sets in with moisture on the forehead and in the axillæ, which becomes so profuse as literally to drench the whole body ; with this the headache passes off, the pulse and respiration become normal, and, the sweating stage over, the patient falls into a deep sleep, from which he awakes much refreshed and apparently well. The temperature will rise immediately the rigor commences, and reach its highest point during the febrile stage, and will fall nearly to normal during the sweating stage. Generally speaking, the cold stage may last from half an hour to three hours, the hot stage from one to sometimes (in a severe case) twelve hours ; the sweating stage usually lasts from two to four hours.

Nursing points.—Quinine is given in cases of malarial fever, and the amount taken may vary from 10, 15, 20, to 60 grains in the twenty-four hours. The physician may order this drug to be administered by the mouth, intravenously, subcutaneously, or as a rectal injection ;

in the last case care must be taken that the soft rubber catheter is passed high up into the rectum. Cinchona is also given, and arsenic is prescribed for the treatment of the anæmia which patients so often suffer from after malarial attacks. A patient suffering from an acute attack of malaria fever will be ordered to bed. The temperature, pulse, and respiration must be taken regularly every four hours, and more often during a rigor. During the cold stage hot blankets, hot bottles, and hot drinks—such as milk or bovril—should be given, and during the sweating stage the patient should have his bed suits changed frequently and be dried with warm towels. The extra blankets, etc., must be removed gradually, one at a time, when the sweating stage commences, so that the patient may not take a chill. The nurse must watch for hyperpyrexia, which necessitates immediate treatment, such as cold sponging, rectal injections of iced water, ice bags to the head, or injections of quinine. Should the thermometer continually rise to 106° in the axilla, the patient should be immersed in a cold bath, and not removed until the temperature, taken in the rectum, is reduced to 102° . The physician will have previously given the nurse orders, in the event of emergency. Another dangerous symptom to be watched for is coma, which may pass away with a crisis of sweating, or may issue in collapse and death.

When allowed to be up and about, the patient should be lightly and warmly clothed, and it is better that he should have some light employment to occupy his time and thoughts; but he has to avoid over-fatigue, constipation, and exposure to very hot sun, high winds, or rain, must be temperate in all things, and follow the dictates of common sense. If possible, he should live in a dry, cool, and sunny climate. His diet should be light, and mostly fluid. Effervescing mixtures often help to cleanse the tongue and “settle” the stomach. Fresh lemonade, fresh lime juice, water, weak cold tea, and ice water sipped are all liked by those suffering from malaria. During convalescence, the food will be gradually improved in quality, and when necessary supplemented by wine or bitter ale.

As regards herself, the nurse working in a malaria district should be specially careful to use her mosquito curtain as a protection during the night. She should also take small doses of quinine (2 to 3 grains) regularly each day, and should continue this preventive measure under medical advice for a month or two.

LIVER ABSCESS

Abscess of the liver, known as tropical abscess, is usually a disease of warm climates, and may be defined as a form of suppuration of the liver, frequently following dysentery. It is common in India, China, Africa, and Japan, is also frequent in Italy, Greece, and Russia, and is much more prevalent among men than among women and children. Europeans living in tropical climates are much more prone to liver abscess than the natives themselves. Generally speaking, it occurs between the ages of twenty and forty, but is met with also in older persons. Preventive measures consist in the avoidance of chill, cold baths, rich food, and excess of stimulants. Regular daily outdoor exercise is imperative.

Symptoms.—The patient complains of headache, loss of appetite, constipation, or diarrhoea, vomiting, nausea, coated tongue, languor, and melancholy; he has no desire for exercise, his sleep is unrefreshing, and there is aching in limbs and body. He is conscious of a sense of heaviness over the liver, and at times has sharp pain; nor can he lie comfortably on his left side. His appearance becomes haggard, and he suffers much from irritability. The temperature rises during the evening to 102° or higher, and falls to about normal in the morning. In some cases, however, though not many, there may be no fever. There is profuse perspiration, so much so that the sleeping clothes may have to be changed several times during the night and sometimes during the day. The patient loses weight, the complexion becomes muddy, the pulse quickens, and respiration becomes shallow and rapid. There is a dry, troublesome cough, the palms of the hands and soles of the feet are cold and clammy, and the urine is scanty and high coloured, and during the formation of the abscess there are rigors.

Nursing points.—After an operation, when the abscess is opened, the patient is kept on his right side, to allow the abscess to drain, and the dressing may have to be changed frequently. The temperature, pulse, and respiration must be taken four-hourly, the urine must be measured, and the diet will be light and easy of digestion—milk and soda, whey, and white soups. Only in extreme cases are stimulants given. Later on, when the patient becomes stronger, milk pudding, lightly-boiled eggs, pounded fish or chicken may be given, and as he

becomes convalescent a more generous supply of food ; but it is essential that it be easy of digestion. After the operation the patient may get well in three or four weeks, but the affection generally lasts several months, and in some cases for a year or longer. According to Sir Patrick Manson, "the prognosis in early operation on single abscess of liver, if there is no dysentery or other complications, is good. In multiple abscess, or in single abscess, if there is active dysentery or other serious complications, the prognosis is bad." If there are more than two or three abscesses, it is "hopeless."

After recovery from abscess of the liver, the patient, if possible, should not return to the tropics, but remain in a temperate and healthy climate.

CHAPTER XXVI

DISTRICT NURSING

BY AMY HUGHES

SCOPE AND REQUIREMENTS OF DISTRICT NURSING: Objects—Varied Conditions—Acute and Chronic Cases—Infants and Young Children—Fighters against Tuberculosis—Responsibilities—Necessity for Special Training—Nurses not Almoners—Raising the Standard—General Hospital or Poor-Law Training—Personal Qualifications—Openings. THE QUEEN'S NURSES: Training—Examination—Appointments—Midwifery—Conditions of the Work—Opportunities of Promotion. DISTRICT NURSING IN GENERAL: Rooms—Cottage Life—Country Work—Spreading the Light—Reticence and Reserve—District Midwifery—School Nursing—Other Duties—Conclusion.

I.—SCOPE AND REQUIREMENTS OF DISTRICT NURSING

THE history of district nursing is already so well known that there is no need to recapitulate its origin and development in this chapter. The motive of the work is the same under all conditions—to bring skilled nursing within the reach of the humblest in their own homes. Modifications to meet special circumstances are necessary, but the main principle has never altered. That this home nursing among the sick poor fills a real need is proved by its rapid growth. Started on the present lines in 1859 by the late Mr. William Rathbone in Liverpool with one nurse, as has been shown in Chapter I., there are now thousands of district nurses in Great Britain and Ireland alone. They are also working in many cities in Europe and under well-organised associations in the United States, Australia, New Zealand, and South Africa; while in Canada the nurses of the Victorian Order, founded in 1897 by the Countess of Aberdeen to commemorate the Diamond Jubilee of Queen Victoria, are established from the Atlantic to the Pacific.

Objects.—The objects of district nursing may be said to be nursing the patients and nursing the homes. The cases attended by district

nurses are of the most varied kind; there is no class of disease, indeed, which does not from time to time come under their care. The work includes both major and minor operations, surgical dressings, first-aid and emergency treatment in accidents and casualties, the care of every kind of medical case, acute and chronic, midwifery, maternity and obstetric work, children's ailments, and not unfrequently special nursing in epidemics.

Varied conditions of the work.—The conditions under which the nursing is carried on are as varied as the cases nursed. The patients are found in single rooms, in crowded tenements, in slum dwellings, in artisan buildings, and in comfortably furnished houses. They live in manufacturing centres, country towns, picturesque villages, isolated farmhouses and cottages in glens, on mountains, and on lonely islands. In each locality the need for skilled and special knowledge how best to carry out the doctor's orders, frequently under unfavourable circumstances, is the same.

Acute cases.—The care of acute cases is naturally the most interesting, although the anxiety imposed upon the nurse is considerable. One of the first lessons to be learned by the district nurse is how to educate the friends and relations into the faithful carrying out of instructions during her necessary absences from the patient. This is no inconsiderable part of the value of her work, as, in addition to all that she does herself, she gives lessons in dealing with the sick which help the wife or mother in the future as well as during the present illness.

Chronic cases.—The nurse's services are equally needed for that large class of patients, technically known as "chronics," which includes the paralysed, bed-ridden, and tubercular cases, whether adult or children. To many of these the nurse's visit is the one bright spot in the day; by her ministrations she brings comfort and ease to those who are obliged to lie from morning to night and from night to morning, with little or no movement, or in constant pain. The friends of these patients can be taught to do much for them and prevent unnecessary suffering.

Infants and young children.—Increasing importance is attached to the care and welfare of infants and young children. The national conscience is at last alive to the shameful waste of infantile life, and to what is even worse, the crippling of young lives from the beginning by neglect of the laws of health. District nurses have wider opportunities than any other class of workers of educating mothers in the

proper rearing of children. They can protest against injurious feeding and ignorant management of infants and young children before irrevocable mischief has been wrought. It is easy to do this on the daily rounds, while visiting general patients, and the mothers are usually more ready to listen to what the nurse in simple language says on such occasions than to accept instructions given in a more formal manner.

The opportunities for this education afforded by district midwifery cannot be over-estimated. The midwife can help the mother both before and after the birth of her child, to the infinite advantage of both.

Another field for work amongst children has been opened under the Act for the medical inspection of school children. The educational value of school nursing undertaken by nurses trained in district work is very great, as they are peculiarly fitted to teach the mothers the elementary principles of health and cleanliness, thus establishing a higher standard of health as well as preventing the spread of disease. I shall return to this topic on a later page.

Fighters against tuberculosis.—The warfare against the “great white plague” of tuberculosis is another development of a district nurse’s duty. She knows intimately the conditions under which many families live and sleep, and can thus minimise the risk of infection as well as mitigate the sufferings of those to whom medical and nursing aid has come too late. By degrees the rudiments of hygiene are penetrating into the homes of the people, and within recent years it has been possible to have open windows during the night and thorough ventilation during the day, to ensure the boiling of water and milk, and the burning of everything that has touched an infectious case. There is a curious fatalism amongst the working classes with regard to infection, whether of the recognised epidemics, such as scarlet fever, typhoid, and measles, or of tuberculosis, and there is still much ignorance and prejudice to overcome; but the nurse who has won the confidence and respect of the people is a valuable factor in dealing with these difficulties.

Responsibilities.—This brief sketch of the ordinary, everyday work and opportunities of district nursing will show that this branch of the profession is worthy of the attention of every educated woman who desires to use her training for the direct benefit of the poor without losing her professional skill. There is an unfortunate impression prevalent in nurse-training schools that district nursing is uninteresting, does not require highly trained skill, and is only suitable for those who

are not particularly smart and clever. There is a vague idea that district nurses spend the greater part of their time in putting dirty patients and their surroundings into nursing order, and that there is little or no opportunity for real nursing.

On the contrary, the responsibilities of a district nurse are much heavier than those of a private nurse, or of a staff nurse or Sister in a hospital or infirmary.

The surroundings of private patients are usually good, as sufficient nourishment, necessary appliances, and regular personal orders from the doctor are the rule. Being constantly in the sick-room, the nurse can note unfavourable symptoms directly they become manifest, and take proper steps immediately. In an emergency she also knows to whom to turn in the household for necessary help. A staff nurse or Sister in a hospital, again, can obtain medical orders and expert assistance without delay should a difficulty arise. She is also familiar with the methods of treatment ordered by the medical staff, and has all necessary remedies on the spot. The district nurse, on the other hand, may seldom see the medical man for whom she works, and her orders are generally brief written directions. She must be quick to detect any change or unfavourable symptoms, and be able to draw information from the patient's friends, a process requiring patience, tact, and judgment. She must also be prompt to act in emergency, know how to improvise appliances from the most unpromising material, and be ready to undertake much responsibility generally for all her cases.

Necessity for special training.—Queen Victoria's Jubilee Institute for Nurses, the largest organisation for district nursing in the world, has gathered one essential fact from the experience of every district nursing association founded before it was incorporated in 1889—that special training, in addition to hospital training, is necessary for district nurses. Any hospital nurse who thinks that with her present knowledge she can undertake work in the homes of the poor has only to be confronted by a typical district case to realise how little she knows. The change from the hospital ward to the home of a working man overtaken by sickness can scarcely be realised until it is seen. Worn out by anxiety and sleepless nights, the wife has given up any attempt at order and cleanliness; the atmosphere is fœtid, every breath of fresh air being excluded for fear of doing harm; the patient is unwashed, and is frequently found in the clothes in which he was taken ill; the bed is

unmade. Dirty plates and glasses and remnants of food are scattered about the room, the hearth is unswept, there is a general atmosphere of depression and dull misery.

To the trained district nurse this is a familiar sight. She comes upon the scene with a feeling of confidence in her powers of putting matters right that insensibly acts upon the patient and upon the anxious, tired-out wife. The latter is sometimes inclined to resent any interference with her husband, and trained tact on the nurse's part is necessary. She explains that she has come to help the wife to carry out the doctor's orders, and proceeds to ascertain the temperature, pulse, and other necessary facts for the chart and written report for the medical man, while allaying the anxiety of the patient and the wife by a few kindly words of encouragement.

Without unduly distressing the patient, she puts both him and his bed in a state of nursing order, and the prescribed treatment is begun. The comfort which ensues encourages him to look forward to the nurse's next visit, and the wife, feeling happier, takes heart again and proceeds to put the room into a more orderly condition. The change effected in two or three visits would hardly be credited by those who have not witnessed it. The patient is washed, clean linen is forthcoming both for him and for the bed, the room is in perfect order, the window is open, and a feeling of well-being pervades the home that a short time ago was in as miserable a condition as can be imagined.

The nurse without district training is likely to attempt too much, or to do too little, under such circumstances. She has no standard by which to regulate her duties, and is therefore usually unable to do all that is well for the patient in the best possible way.

Having said so much about the necessity for special training, let me add that none who desire to undertake district nursing should be deterred from doing so by the fact that this further "training" is indispensable. It really consists in the gaining of knowledge to enable them to use their nursing skill to the greatest advantage.

Moreover, in addition to the actual nursing there are endless opportunities for improving the conditions of the people which only special training can discover. In a hospital or infirmary there is little or no scope for a nurse who is working for her three years' certificate to ascertain the conditions under which the working classes live. To work intelligently in their homes she must understand something of practical hygiene and

the general principles of sanitation. She should know of the laws relating to drainage, a pure water supply, the prevention of unhealthy dwellings, overcrowding, and other evils which affect the health of the community. The conditions of labour both for men and women, the means of thrift, the moral effects of the surroundings of the people, are all closely interwoven with district nursing. The great problem of relief constantly confronts district workers, and they should rightly understand the various principles of its administration, whether in connection with the Poor Law or on charitable lines.

Nurses not almoners.—Another fundamental principle which the Queen Victoria Jubilee Institute has found it necessary to insist upon is that nurses shall not be almoners. Their visits are to be valued by services rendered, not because relief will follow. This is one of the hardest things for a district nurse to understand. It seems almost criminal not to give nourishment at once to the sick mother or child when it is required to build up strength, and yet from the wider point of view, such relief forthcoming in time of sickness, without question and inquiry, saps the foundation of thrift and does away with the necessity for “laying by for a rainy day” while the bread-winner is in health and in receipt of regular wages. The district nurse is trained to avoid mere sentiment, and, in a businesslike though sympathetic way, to convey the special needs of any patient to those fitted to deal with the matter as may be best, not only for the immediate trouble, but also for the future good of the family. It is often a revelation to find how many more resources a patient possesses than would be supposed from the conditions under which the nurse first finds the case. Friends and relations come to the rescue, necessities are redeemed from the pawnshop, club funds become available, and a general effort in the way of self-help is made when it is understood that nothing will be provided beyond absolute nursing necessities by the nurse or the society to which she belongs.

Raising the standard.—From what I have said it will readily be understood that a complete nursing education, with special district training in addition, is needed to fit nurses for the responsibilities that must devolve upon them at one time or another. The standard has gradually been raised by all district associations, not only as regards the length of time given, but also the position of the institution in which it was obtained. It is now recognised that full general training is requisite to ensure both knowledge and discipline. The idea that inferior

qualifications will suffice for nurses who attend the poor than for those who attend the rich still lingers, but it is gradually dying out as the extension of the work proves conclusively that the full term of three or four years' training in an approved nursing school is essential.

General hospital or Poor Law training?—The question is sometimes asked whether general or Poor Law training is the best preparation for district nurses. The reply is that the standard of nursing needed is the best that both systems can produce. The clever surgical nurse has abundant scope for her energies, especially in the mining and quarrying centres, and her knowledge of medical work will be fully tested in carrying out special treatment, such as hot-air baths, easy enough in a ward, but calling for resource and capability to administer them successfully in the home of a working man. Nurses trained under the Poor Law and in general hospitals to which no medical students are attached, have the advantage of being accustomed to apply dressings and carry out treatment themselves. Poor Law nurses see more of feeble, bed-ridden patients, and also of the convalescent stage of cases, than is possible for nurses in the busy wards of a general hospital. Practical experience proves that the most complete training, whether in general or Poor Law hospitals, in London or the provinces, still leaves much for district nurses to learn. The special nursing of women, of children, of infectious diseases, and, above all, midwifery, are most necessary if they are to be prepared for all emergencies that may arise. It is this very variety of work that is the special charm of district nursing. There is so little monotony in it, for even when the cases are similar in character, the surroundings of the patients differ, and considerably modify the course of treatment.

Personal qualifications.—A nurse holding her certificate of training, and who is considering the question of district work, should be sure that she possesses the faculty of liking her patients for themselves, apart from their surgical or medical interest as "cases." Without personal sympathy with the patients, a district nurse is never a success, however clever or competent she may be. Tact, courtesy, and adaptability are necessary for all nurses, but especially so in this work, and, in addition, the power of seeing things from more than one point of view. Being satisfied on these points, she must next consider the question of health. Under the most favourable conditions district nursing means exposure to all weathers, and often spending hours in wet boots and clothes. No

one should think of the work who has rheumatism or a predisposition to it. In the majority of districts cycling, if not essential, is very necessary, and therefore a generally healthy physical condition is needed to withstand fatigue and somewhat irregular hours. The outdoor life compensates for much, and as a rule there is ample opportunity for rest each day between the morning and evening cases.

Openings.—The whole of Great Britain and Ireland is so covered with district nursing associations that it is not difficult to obtain a post in any given locality. Positions vary considerably, however, as regards remuneration, management, and the methods under which the nurse attends the cases. Queen Victoria's Jubilee Institute for Nurses has, since its incorporation in 1889, raised this work from individual effort to a national movement. Not only have established associations affiliated themselves with it in every part of the United Kingdom, but new societies adopt its methods and obtain the services of Queen's Nurses. Such affiliated associations undertake the entire responsibility of the maintenance of the requisite nursing staff, whether that consist of one or of many members. In London and other populous and wealthy cities, such as Liverpool, Manchester, Birmingham, Leeds, Brighton, Dublin, Glasgow, and Cardiff, funds are forthcoming to maintain separate Homes in various areas, each with its Superintendent and staff of nurses, as may be needed.

In the metropolitan area thirty-eight district associations are maintained in various districts, of which the East London Nursing Society is the pioneer, having been founded in 1868. The Metropolitan Nursing Association, started in 1874, raised the standard of district nurses, and initiated that system of practical and theoretical training which, adopted and extended by the Queen's Institute, has made the work so great a success. There are more than 500 affiliated associations in England and Wales, nearly 200 in Scotland, and about 100 in Ireland, with considerably over 1,500 Queen's Nurses actually at work, and more than 3,000 names on the Roll of Queen's Nurses.

In affiliation with the Queen's Institute in England, there are eighteen County Nursing Associations, founded for providing midwives and village nurses in addition to Queen's Nurses. There are many rural districts where neither work nor funds are available for the maintenance of a fully-trained nurse, yet where both midwifery and care of the sick are urgently needed. Village nurses are usually women of the county

specially selected and trained by the Central County Committee. Grants are generally given from the Technical Education Committees of the various County Councils for midwifery training, supplemented by some practical general nursing experience in the homes of the people, at the expense of the County Association. In return for this training the nurses agree to serve for a fixed period, usually three years, at a stipulated salary, wherever they may be needed in the county. They are supervised by the County Superintendent, a Queen's Nurse and midwife in the employment of the County Committee, who is also responsible for all the nurses working in districts affiliated to the County Association, whether Queen's Nurses or not. There are many openings under County Associations for nurses whose general training does not qualify them to become Queen's Nurses, or who, for various other reasons, are unable to apply for admission to this Institute, and yet are wishful to hold county posts.

At the beginning of 1908 there were 540 nurses and midwives employed by the eighteen affiliated county associations, in addition to 122 Queen's Nurses (including 24 County Superintendents and Assistant Superintendents).

There are three County Associations in Scotland and one in Wales, whose main object is to supplement the funds of associations within the county area.

There are also a number of independent associations both in London and the provinces, the Committees of which employ hospital-trained district nurses. One of the oldest of these societies in London was founded by Mrs. Ranyard in 1857 as the Bible-women and Nurses' Mission, the nursing branch being started in 1868. Candidates are received for three years' training under the conditions of the society, and work in various parts of London under superintendent nurses.

The Holloway District Nursing Association, the first branch started by the Metropolitan Nursing Association, soon after its foundation in 1874, provides trained district nurses for a considerable area in North London. Among other centres of district work may be mentioned Bristol, Chester, Derby, Newcastle, Nottingham, and others; and there are also many trained nurses maintained for parochial work or by private philanthropy in special districts both in town and country. Some eight or nine independent County Associations have been formed to meet the needs of rural districts by providing trained midwives and district nurses.

A large and well-supported association, known as the Cottage Benefit Nursing Society, with branches throughout Great Britain, was founded to provide cottage nurses among the poor, who contribute in club fashion to obtain their services as required. These women are not usually trained in hospital, but receive a certain amount of district training under trained nurses. Some qualify as midwives, some only receive training as monthly nurses, and are sent to the subscribers in each district as required. They live in the house of the patient, and in addition to the nursing take a share in the housework as may be needed. In a maternity case they undertake the cooking, the housework, and the care of the children and husband, being generally responsible for the welfare of the family, as well as for the mother and child. There is no doubt that in many households the presence of such a woman is a great comfort, and relieves the wife and mother of much anxiety. The difficulty of the system consists in the nurse's services being available for only one family at a time, and therefore a large staff is needed for a busy district, while often chronic and minor cases are unable to obtain nursing services at all. The accommodation available in the poorer homes being very limited is also an objection to the nurses living in the house.

The nurses of associations working on these lines which are affiliated to County Associations in connection with the Queen's Institute are required to be certified midwives, and are inspected by the County Superintendent.

II.—THE QUEEN'S NURSES

Nurses qualified as to general training who desire to become Queen's Nurses can receive the necessary district training in three ways:—

1. **From Queen Victoria's Jubilee Institute.**—Selected candidates, after a trial month, are required to sign an agreement to serve the Institute wherever required for a stated period (one year) after the completion of the district training. This is given in one of the Homes approved by the Institute, and the nurse receives a salary at the rate of £25 a year, with board, lodging, laundry, and uniform during the required six months. After the district training is completed, Queen's Nurses receive salaries from £30 a year with the same allowances. Superintendents' salaries vary according to responsibilities.

2. **On behalf of a local nursing association,** approved by the Institute, in which case the nurse enters into an agreement with the Com-

mittee of the association to work for a stipulated period at an arranged salary, during and after the district training.

3. **At the nurse's own expense**, by arrangement with one of the approved affiliated Homes. In this case the nurse enters into no agreement as to future work.

On the completion of the district training the nurse's name is submitted to her Majesty the Queen for appointment as a Queen's Nurse, and her Majesty's sanction having been given, she receives the badge and brassard of the Institute, which she retains so long as she remains a Queen's Nurse. The names of nurses are submitted for appointment quarterly, on January 1st, April 1st, July 1st, and October 1st, each year. A nurse's name will be continued on the Roll so long as she works satisfactorily and is employed by an affiliated association. Queen's Nurses under engagement to any affiliated association are subject to the rules and regulations of that association.

Nurses wishing to be trained by the Institute for work in England or Wales should apply to the General Superintendent, 120, Victoria Street, London, S.W.; for work in Scotland to the Superintendent of the Scottish branch, 29, Castle Terrace, Edinburgh; for work in Ireland to the Superintendent of the Irish branch, 12, Upper Pembroke Street, Dublin.

Information as to the approved Training Homes can be obtained from the General Superintendent of the Institute, or in Scotland and Ireland from the Superintendents of the Scottish and Irish branches.

The Institute provides three years' hospital training for a few Welsh-speaking candidates who wish to become Queen's Nurses and will undertake to work in Wales, if desired, for two and a half years from the completion of the district training.

What the training comprises.—District training for Queen's Nurses includes, in addition to practical work, instruction by means of lectures and classes in hygiene and sanitary matters, obstetric nursing, the care of women and infants in child-birth, and also cookery, unless the nurse has had a course of instruction in this during her hospital training. Information on the principles of relief, acquainting the nurse with the working of the Poor Law and other social matters, is also given.

The routine of training.—In whatever Home the candidate is trained the routine is much the same. A certain number of cases are assigned to her, and she is instructed by the Superintendent and her

assistant in the methods of dealing with the patients, carrying out the doctor's orders, and instructing the friends.

The number of patients visited daily varies according to the nature of the cases and the locality in which the nurse is working. The average time employed for each case varies also. As a rule, it is from half an hour to an hour and a half for acute and heavy cases. The work in such cases includes the complete toilet of the patient, bedmaking, charting and recording notes for the doctor, the preparation and tidying up after any special dressings or applications, often some little preparation of invalid food, and also leaving the room in perfect nursing order. In the early days of district nursing much time was spent in actually cleaning the sick-room, but it is wiser to encourage the friends of the patient to perform this necessary duty under supervision, than for a busy nurse to expend her time and strength upon hard manual labour which can be better done by others. Under no circumstances, however, should soiled dressings, dirty water, or unwashed utensils be left for the friends to clear away after the nurse's visit. She should always see these matters attended to before leaving, or if necessary do them herself.

The hours on duty are usually from 8.30 or 9 a.m. to 1.30 or 2 p.m., according to the local conditions of labour. Then a rest in the afternoon, and another round in the evening, commencing usually at 4.30, for about three hours, depending upon the number of cases required to be visited, some for the second, or even the third time during the day. Only serious cases are visited on Sunday, and the hours of work are much shorter. As a rule, district nurses do not undertake night duty, as it is obviously impossible for them to devote many hours to one patient when others are needing their services. There is unfortunately a widespread but erroneous impression that Queen's Nurses never undertake night work. This is not at all the case, for circumstances arise which may make night nursing essential, especially in scattered districts. Provided there is no abuse of the services of the nurse in this respect, and that provision can be made for her other cases and her own rest and sleep, a Queen's or any other district nurse should attend a critical case at night, where no proper help is available and skilled care may turn the scale in the patient's favour.

Examination.—After satisfactorily completing the training the nurse is eligible for the examination in practical district nursing which pre-

cedes her recommendation for the Roll. The names of candidates are submitted once every three months, and are considered with the reports furnished by their Superintendents and those by the Inspectors of the Institute, who see every nurse's work before she is recommended, whether she has trained in England, Scotland, Ireland, or Wales.

Appointments.—The appointments depend to a considerable extent upon these reports, and also upon the amount of experience gained before district work is undertaken. The individual wishes of the nurses are considered, as far as the exigencies of the work permit—for it will be understood that it is not always possible or desirable to station every nurse just where she wishes to be. It is usual to place those who have come straight from their hospital or infirmary training in a smaller Home for a time, so that they may still have the advantage of a certain amount of supervision and help from more experienced nurses. Those who have previously held posts of responsibility or have shown themselves specially capable are recommended for "single" districts, where they are directly responsible to the Committee and to the doctors for whom they work.

Midwifery work by Queen's Nurses.—In many cases Committees require the nurse to possess the certificate of the Central Midwives Board, and therefore midwifery training is sometimes offered to suitable candidates at the completion of the district training. It is also open to Queen's Nurses at the completion of the twelve months' agreement, or to those who apply with a view to qualifying for special posts. This training is given free of all expense to the nurse, but without salary for the required time, usually four months. The nurse agrees in return to work where needed for twelve months.

The Midwives Act of 1902 has greatly affected the views of affiliated associations upon the question of Queen's Nurses holding this qualification, because the handy women and the old midwives are gradually disappearing, and it is necessary for trained and certified women to replace them. Committees prefer that their district nurse should be able to act in an emergency, and assist the doctor in special difficulty, even if she is not actually required to practise midwifery. Moreover, without this special knowledge nurses would be of little value in rural places, and especially in the isolated districts of Wales, Scotland, and Ireland, even though the Midwives Act does not apply to the two last-named countries. The midwifery certificate is also essential for Inspectors, County Superintendents, and Assistant County Superintendents, as they

must be able to help and guide nurses practising as midwives, who naturally look to them for advice should difficulties arise.

Conditions of work.—In whatever part of the United Kingdom Queen's Nurses are stationed the conditions of their work vary but very little. Affiliated associations are required to accept certain principles, the most important being the three now to be specified :—

1. "*The nursing of patients shall be carried out under the directions of medical practitioners.*"—Mistakes have arisen about this most necessary rule, as it has been supposed that only cases sent in by doctors, or where doctors are in regular attendance, are to be attended. It is the intention of the Queen's Institute that anyone in the district may apply to the nurses for their services, but that beyond rendering first aid no patient shall be regularly undertaken as a case without the knowledge of the doctor. There are many chronic patients who merely require the visits of a nurse to keep them in nursing order, but who often do not see a doctor for months. The nurse can report from time to time on the condition of these patients, so that the medical man will know what is being done. No Queen's Nurse is allowed to treat cases on her own responsibility.

2. "*The services of the nurses shall be for the sick poor and working classes in their own homes without distinction of creed.*"—The work is carried on on absolutely undenominational lines, and thus appeals to all, enabling members of varying creeds and sects to meet on one common platform. The influence of the nurses is exercised for good, and they can, when necessary, put patients in touch with the special religious body to which they profess to belong ; but Queen's Nurses are "strictly forbidden to interfere in any way with the religious opinions of patients or of members of their families."

3. "*The nurses shall not, except in cases of urgent necessity, give nourishment or other relief.*"—Any case needing help is reported to the proper authority, frequently a member of the Committee. There are so many problems depending upon this question of relief, even in sickness, that the Queen's Nurses must stand aside as personal agents for fear that their special work of bringing skilled nursing into the homes of the people may, to its detriment, be confused with almsgiving.

Affiliated associations have their own arrangements to meet local necessities ; but the above principles are always maintained. Many are organised on a provident basis, with a scale of contributions suit-

able to all classes, but with the understanding that the nurse's services are given free in cases of necessity. There are also arrangements for attendance on patients who do not belong to the working classes and yet cannot afford the usual fees for a trained nurse, or who only require daily attention for a time. In districts where independent "visiting nurses" are not at work, these services of the Queen's Nurses are a great boon to such patients, who are charged on a sliding scale, the fees being a small source of revenue to the associations. It is always stipulated that the needs of the poor shall come first. Every class of patient is encouraged to give a donation, however small, to the Association.

Uniformity of work is maintained throughout affiliated Associations by the Inspectors of the Institute, who regularly see the work of every Queen's Nurse and periodically visit every district.

Opportunities of promotion.—There are many openings for promotion, the positions of responsibility being those of senior of three or four nurses, senior staff nurse, or assistant to the Superintendent in a Home, training or otherwise, Superintendent of an Association employing four or more staff nurses, Superintendent of an approved Training Home, County Superintendent, Assistant County Superintendent, Assistant in the Central Office, and Inspector.

The salary of a Queen's Nurse commences at £30, with allowances for uniform, laundry, board, lodging and attendance, or their equivalent, rising to £32 the second year and £35 the third year, or an inclusive salary of equal value. The salaries of those in responsibility vary from £40 to £100 or more. County Superintendents and Inspectors usually receive inclusive salaries.

The capabilities of a Queen's Nurse are often tested by her success as senior of a staff of three or four nurses. She is responsible to the Committee for the housekeeping, the nursing stores and appliances, the register of cases, and the general guidance and direction of the work, while having charge of a certain number of cases herself. Another opportunity is afforded by the position of senior staff nurse or assistant to the Superintendent of a large Home, which offers a means of learning both the domestic and nursing management of an association.

Superintendents.—The duties of a Superintendent are varied, and her position a responsible one. Not only must she be an experienced district nurse, knowing how to meet all emergencies that may occur in

the work, and thus able to instruct her staff, but she must possess tact and enthusiasm, together with the power of enlisting the interest and support of those with whom she comes in contact, and securing the confidence and support of the Committee under whom she works. She must be in personal touch with the medical men, and also possess their confidence, so that they may be willing to accept her explanation if difficulties occur. The district nurse may not work altogether smoothly on every occasion with the medical man; the very fact that the nurse and doctor meet so seldom is a fruitful source of misunderstanding. The patients and their friends have a curious faculty for so repeating remarks that, without being actually untrue, they convey a meaning entirely different from that of the original observation, and much trouble may be traced to this simple cause. The nurses must trust the Superintendent and respect her authority, and she must be able to enforce discipline and order without forgetting that she is no longer dealing with probationers, but with women probably of equal hospital experience with herself, and often possessing much practical district knowledge.

In addition to nursing knowledge, the Superintendent should be a capable housekeeper. Much of the welfare and health of the nursing staff depends upon good and varied food, and small home comforts. These greatly affect workers frequently physically overtaxed, and who under ordinary conditions spend many hours daily in sick rooms and unwholesome surroundings. Committees naturally require strict economy in dealing with public funds provided for the Association, but a good administrator can obtain both ample and varied food without committing extravagance.

Domestic arrangements are often a difficulty, as the money available does not command a high class of maid, and this entails extra care and oversight. It is only practical knowledge which can secure the best service from the domestic staff and also prevent waste in every department. For instance, it is not true economy to allow the stock of household necessities to be reduced to a minimum, and then have to present a large bill to the Committee for renewals. It is more economical in every way gradually to replace things as they wear out or are destroyed.

Thoughtfulness for the welfare of the staff is essential and pays best in the long run. To ensure that cloaks and boots are properly dried, that if a nurse is detained her meals are served hot and appetisingly on her return, that anyone who is called out late or in the night should

have refreshment on returning, may seem trifles hardly worth considering. Yet when they are disregarded, or from a sense of discipline and love of order are made impossible, the harmony of the Home and the good feeling amongst the nurses, to say nothing of their general health, are never so satisfactory. It requires much experience to combine the two duties satisfactorily, and it is not as if the Superintendent could devote much time to her housekeeping, as she must be on the district constantly, supervising and helping the nurses to meet the many and varied demands upon their time and skill.

Another duty of the Superintendent is to keep all the various nursing registers and books, as well as the household accounts. If this is done regularly and methodically it is a comparatively easy task. Daily entries and a weekly review and balancing are much less trouble and bear better results than trusting to memory and intending to have all ready for the monthly Committee, when probably unforeseen circumstances may render it impossible to give the necessary time for the large amount of work that is then required. Many Committees require an invoice for all items of expenditure, and though this occasionally may be somewhat difficult, it is a wise and helpful system, and involves much less trouble in the balancing of accounts and preparing of the annual report.

Every Superintendent would do well to educate her staff of nurses in the proper keeping of the various books. Most nurses hope in time to hold the post of Superintendent, and it is quite as necessary that they should understand the routine book-keeping and accounts as that they should carry out the nursing details on approved lines. This entails further trouble on the Superintendent, it is true; but it is a valuable part of the education of her nurses and enables them to bring a practical thoroughness into their work which is all-important in the positions which they may be called upon to hold.

The proper delegation of work is often a special difficulty to women, but a Superintendent should make the senior nurse at any rate capable of taking a part of her work should she suddenly from unavoidable circumstances be absent. It is not always easy in a busy centre thus to train and prepare the staff for further responsibility, but it is an important part of the general plan for securing the highest standard, not only in one particular Association, but in every district where the nurses may be called to work.

The Superintendent should also take an active interest in all societies which concern the welfare of the people—charity organisations, health societies, crèches, maternity associations: anything, in fact, that affects the condition of the patients with whom she and her nurses are connected.

The salaries of Superintendents usually vary according to the size of the staff and the responsibilities of the position. They range from £50 to £100 per annum, with the usual allowances.

County Superintendents.—The post of County Superintendent is interesting and responsible, and is suitable for a nurse who has been proved not only to have attained a high standard in practical nursing and midwifery, but to possess tact and powers of organisation. Good health and expert cycling are essentials, as the distances are long and country roads trying, and the work must, of course, go on under all conditions of weather.

The County Superintendent is responsible to the Committee of the County Association in the same way as the Superintendent of a Home is responsible to the Committee of the district Association. She is required to keep certain registers and books and to present such reports of her work and details of expenses as the Committee may require. Her duties comprise the organisation of new Associations within the County and the recommendation of the nurse suitable for the district. If the population is above 3,000, Queen's Nurses are employed, for whom the County Superintendent has a certain amount of responsibility. In districts with a lower population nurses with less hospital or district training are frequently employed, and in the thinly populated rural areas the village nurse, trained by and under agreement with the County Committee, is appointed. The County Superintendent is responsible for the selection of candidates as village nurses, and for the arrangements for their training, as may be directed by the County Committee. She is also similarly responsible for the selection of trained nurses other than Queen's Nurses, and for the recommendation to the Queen's Institute of Associations as fulfilling the conditions for the employment of Queen's Nurses.

The supervision of the work of the village nurses is one of her most important duties. They are seen regularly and frequently, and all the cases on the books are visited while the nurse carries out her necessary nursing duties. In this way the nurses are helped and instructed

in their work, and the Queen's and other nurses are also regularly inspected.

There is, further, the distribution of the nurses among the various Associations, for, especially with the village nurses, it is desirable to effect transfers from time to time for various reasons. Some counties have an emergency Home, where the County Superintendent lives with her Assistant, if one is provided, and such nurses as are reserved for emergency work in the county. The number of these nurses varies, and also their nursing experience; they are most useful in preventing districts being left without a nurse or midwife in case of illness or other unavoidable circumstances. The County Superintendent is responsible to the County Committee for the housekeeping and maintenance of this Home and the control of the nurses. In some County Associations, by arrangement with the County Council, the County Superintendent acts as Inspector of Midwives under the Midwives Act, and is responsible for all practising midwives in the County Council area. This extends her powers of usefulness, enabling her to raise the standard of this work amongst the *bonâ fide* midwives, and to maintain it amongst those who qualified by examination.

The post of Assistant to the County Superintendent offers an excellent experience to nurses qualifying for further promotion, as it enables their capabilities to be tested. It is important that both County Superintendents and their Assistants should be able not only to meet Committees to explain the lines of work and organise new Associations, or help in the settling of the many difficulties that arise in the work, but also to address general meetings, whether the annual ones of the subscribers of affiliated Associations or of those interested in forming new districts. It is essential, too, that they should be competent to give simple classes or lectures to mothers and women on the care of infants and young children, and other subjects which bear upon the health of the people.

The usual commencing inclusive salary of a County Superintendent is £110, rising to £120, with travelling expenses; but special arrangements are made by the individual County Association as to a further amount when the duties of Inspector of Midwives and other responsibilities are undertaken.

The salary of the Assistant County Superintendent also varies according to the amount of responsibility she incurs.

Inspectors.—The position of the Inspectors of Queen Victoria's Jubilee Institute is a most responsible one, as practically they represent the Institute in their respective areas.

There are at present six in England, three in Scotland, two in Ireland, and one in Wales. In both Scotland and Ireland the heads of each of these branches of the Institute inspect from time to time, in addition to their other duties.

Every district, not in the area of a County Association, desiring affiliation to the Institute is visited by an Inspector, who explains the conditions of affiliation, and gives advice and assistance in framing the constitution and rules on the lines found most suitable, from the experience the Institute has gained of Associations working under similar local conditions.

The Inspectors are required to visit every Queen's Nurse twice annually, and see the cases on her books at the time, except those nurses working in large Homes under a Superintendent, or in districts affiliated to a County Association. These are visited once a year, with the exception of the Homes where candidates for the Roll are being trained at the expense of the Institution. These candidates are always inspected before admission to the Roll, also all staff nurses who are recommended as suitable by their Superintendents and Committees. After each of these inspections a full report is furnished to the Central Committee, and the result is entered on the Roll of Queen's Nurses, and from these reports the nurse's capability and general usefulness are ascertained.

It is this principle of inspection and supervision that has maintained a uniform standard of district nursing work in connection with the Queen's Institute. The idea of such inspection is not always welcomed at first, as it is feared that it may mean interference with local arrangements and give an impression of dual control to the nurses and to those interested in the support of the Association. In practice, however, this fear is soon proved to be unfounded, and both the Committee and the nurses come to rely upon the Inspector for advice and help in difficulties as well as for encouragement. It has also frequently happened that when criticism has been resented at first, it afterwards has been acknowledged to be well founded.

It is very desirable that Inspectors should be able to address both large and small meetings to explain the lines of work generally. They should also understand and be able to interest those whom they meet,

both committees and nurses, in the various matters that are collateral to district work, and thus maintain its relations with all agencies that make for a higher standard of cleanliness and health among the people, whether in connection with national or with local movements. The Inspectors in England, Ireland, and Wales are directly responsible to the Queen's Institute; those in Scotland to the Scottish Council.

It will be seen, therefore, that Queen Victoria's Jubilee Institute affords opportunities for every kind of district nursing in every part of Great Britain. The uniformity of work and the combination of varied experiences enable affiliated Associations and Queen's Nurses alike to benefit by their connection with this truly national organisation.

III.—DISTRICT NURSING IN GENERAL

The interests and difficulties of nursing in the homes of the people are many, and are experienced equally by those working independently of or in connection with established Associations.

If a nurse accepts a post in a Home under a Superintendent, or one where she works with two or three other nurses, it is comparatively easy to adapt herself to her new surroundings. She has advice and help in learning the special traits of the locality, and finds the conditions of salary, lodging, board, etc., arranged for her in common with her fellow workers. It is often more difficult to work smoothly with only one or two nurses, for unless they are personal friends the individual temperaments may not be harmonious. But in no way ought personal feelings or opinions be allowed to affect the efficient and careful nursing of the patients.

When a nurse undertakes a single district there are many hitherto unsuspected problems for her to solve. Dealing with these problems becomes still more important if she is the first nurse of the newly formed Association.

The district nurses' rooms.—One practical difficulty which a district nurse working alone has often to meet is concerning the rooms in which she is to live. In many places, both in small towns and in the country, the difficulty of obtaining suitable accommodation for the nurse is very great. In districts which are health resorts or by the sea, people do not care to take a permanent lodger, preferring rather to receive higher rents from visitors during the season. This often prevents the nurse from obtaining rooms with the people most capable of giving her

proper attention. In other places, especially manufacturing centres, although the people are most kind-hearted and willing to do all they can, their ways are rough and their notions of cooking rudimentary.

A nurse needs tact, patience, and knowledge to guide the well-meaning but unsatisfactory efforts of her landlady, which are in sharp contrast with the arrangements of a comfortable home. The nurse should endeavour, without giving undue trouble, to explain what she wishes done, and failing to get this she should bring the matter to the notice of the Secretary or to a member of the Committee, leaving it to them to find a remedy. Much trouble and misunderstanding have been caused by a nurse taking the law into her own hands and quarrelling with the landlady suggested by her Committee, without realising that she is probably the best person available in the whole district. Although it is not possible to be always punctual for meals, a nurse should give a little consideration to the difficulties of keeping meals hot or having to serve them at odd hours, when perhaps the landlady may have business of her own to transact with which the nurse's delay and unpunctuality may seriously interfere.

Cottage life.—In some districts, especially in the country, a cottage is provided for the nurse, and if she has a friend or relation to share it with her, many of the above difficulties will not arise. It is most inexpedient for a nurse to live quite alone, without making full and ample arrangements for proper care and service. The patients need her full vigour, and it is fair neither to them nor to herself that she should undertake regular household work and the preparation of her own meals. A tired woman, often exposed to bad weather for hours at a time, should have her house kept in order and her meals well served and ready for her. Neglect on these points has caused the health of innumerable district nurses to give way, and in some cases irreparable mischief has been done. It is not easy for a nurse, especially one whose work has hitherto been mapped out for her, to arrange her rounds in a new district to the best advantage both for the patients and herself. It needs the gift of organisation to do this satisfactorily, especially in a thinly populated area; but it is most necessary for the best interests of the work and for the welfare of the nurse, who thus avoids needless delays and fatigue.

Country work.—District nursing in the country has its own difficulties as well as its special charms. In towns, large or small, there are doctors at hand, neighbours who can be called in for night duty or

to watch beside the patient in the daytime between the visits of the nurse, and also the work can be arranged more evenly, as the distances are not so great. In the country, especially where midwifery is undertaken, the nurse may be miles from a doctor, may find patients too ill to be left with safety, and no one available who can take any responsibility, and therefore she may be obliged to devote herself almost entirely to one case for a day or two at a time. It is impossible to maintain the order and regularity of a large Home or even of an Association where two or three nurses are working together. The country nurse must be prepared to be on duty almost incessantly for two or three days and then have an interval with little or nothing to do. This irregularity appeals to some, while others are distressed if they cannot work on methodical and regular lines. It is wiser for a nurse, when asking to be recommended to any given district, to ascertain the conditions required in that locality.

Spreading the light.—The educational side of district nursing is one of the reasons why the work has proved so successful. It is also a reason why the nurse should be adequately prepared to use the many opportunities that come to her. So much is being done to remedy the evils arising from ignorance and carelessness that there is a tendency at the present time to forget that, however simple the home, it belongs to its owner, and zeal for improving the health of the people may overstep the bounds of courtesy, and unduly intrude upon the privacy of home life. There is no object to be gained by ignoring the self-respect and independence of the people—qualities to be cultivated rather than undermined, however laudable the desire that causes of disease should be banished. The health visitor and sanitary inspector have comparatively little difficulty with the worthless, thriftless portion of the populace, who have hopes of gaining some benefit or charitable dole by admitting such visitors to their untidy dwellings. The district nurse gains her admission on quite a different footing, and, while carrying out definite work, is able to educate and influence the rest of the household, almost without their being aware that she is so doing.

Cleanliness and sanitation, though acknowledged necessities, are not always easily obtainable in the dwellings inhabited by the patients attended by district nurses. One of the simplest methods of ascertaining the condition of the water supply, the drainage, and means of disposing of foul matter, is for the nurse herself to empty utensils and

dispose of soiled dressings. The instruction given her during her district training helps her to understand whether the sanitary arrangements are satisfactory or not. It is not necessary to say much to the tenants of the dwelling if defects are present, as too much zeal on the part of a district nurse has led before now to her patient being required to move by an irate landlord. The nurse should quietly mention the matter to the medical man in attendance on the case, to a member of her Committee, or to one of the sanitary authorities, and then must leave the question to be dealt with by those who are responsible. District nurses should know who are the sanitary authorities in their district and remember that rules vary in different localities.

It is not necessary that there should be foul smells or a bad taste to lead to suspicion of imperfect drainage or a polluted water supply, the most insidious evil being the leakage of sewer gas into the dwelling-rooms, or contamination of the water supply by sewage. The suspicions of the nurse will be aroused by complaints of sickness, diarrhœa, and sore throats among the inmates of a household. There will be complaints of unrefreshing sleep, headache, weariness, loss of appetite, gathered fingers, and other troubles. Surgical cases do not heal quickly in such houses, and there is a tendency to erysipelas. The nurse should communicate her suspicions to the proper authority without delay, as lowered vitality consequent on these conditions renders people an easy prey should an epidemic appear in the neighbourhood.

Reticence and reserve.—Another danger for a nurse who undertakes the care of a single district may arise from the unavoidable loneliness she must experience before she makes any acquaintances in her new surroundings. It is very desirable that she should not become familiar with any for a time, until she understands something of the relations of the different people one to another. It is difficult for one who is accustomed to city life to realise how much gossiping can go on in small towns or in rural districts. The greatest caution is necessary in expressing any opinion as to the place or as to the people of the neighbourhood. The nurse may discover that she has been drawn into criticising a relation or intimate friend of her interlocutor's, and thus be placed in a very uncomfortable position from which she may find it difficult to extricate herself without leaving an unfavourable impression. It is better to be reticent at first, until there has been time to understand the affairs of the district.

It is advisable also to avoid forming friendships, however kindly people may be. If the nurse identifies herself with any special family or families, and difficulties arise, she may be involved in local quarrels, which, although not directly concerning her work, will certainly be detrimental to it. District nurses, being to a certain extent public persons, must not expect to have all the privileges of private people even in their off-duty time. Things that are perfectly harmless in themselves, and which would not matter in the least in other circumstances, are injudicious for those who in a sense are public servants, and are supported for special work by people of every shade of opinion in creed and politics. Many a good nurse has found herself in difficulties by not realising that even in her off-duty hours she is bound to remember her official position. It is only when absent from her district that she can relax and let her own feelings have free play.

The personal influence of a district nurse is very great if wisely exercised, and whether the work is fully appreciated depends much upon her. Not only must she aim at enlisting the help and sympathy of her Committee, but she must put herself in touch with all those who can help to support the Association or aid the patients without being in direct connection with it.

Needlework guilds for providing garments for lending, maternity bags, and other necessities are a valuable means of interesting people of every class. Arrangements can be made for convalescent dinners for special patients, for drives for invalid children, for visitors to read or teach needlework or other employment to aged or chronic patients, and thus generally to lighten the burden of illness without suspicion of unwise charity. The nurse may also be able to give valuable talks and classes to mothers and young girls. Such talks are usually greatly appreciated, and are of great value in removing ignorance and prejudice.

DISTRICT MIDWIFERY

In addition to general nursing, there are special subjects which recently have become important features of district work. The passing of the Midwives Act in 1902 has greatly widened the field, as owing to its operations district nurses are more and more required to hold the certificate of the Central Midwives Board. It is not always desired that they should practise as midwives, although this is often needed in rural areas, but that they should be prepared in any emergency, and

also qualified to instruct mothers in the management of infants and young children. There is, too, an increasing number of openings for trained nurses with this certificate as Inspectors of Midwives under the County Councils and other authorities.

The district nurse who is thus qualified may be called upon to fill one of two positions. She may be engaged for midwifery and maternity cases only, working in conjunction with district nurses who are responsible for the cases of ordinary sickness ; or she may be appointed to a single district, and be responsible for both midwifery and general nursing.

1. Midwifery and maternity cases only.—Under the first of these conditions the nurse is usually employed in an urban district, and attached to the staff of a Home under the direction of a Superintendent, or maybe in a small town with one or two nurses. A midwife's practice in thickly populated districts throws less responsibility upon the nurse, as medical aid is easily obtainable under the conditions prescribed by the rules of the Central Midwives Board, or in sudden emergency. On the other hand, the conditions of the patients are much less satisfactory. Overcrowding, bad feeding, and frequently hard work in factories and other occupations undesirable for pregnant women, lead to abnormalities and complications which too often tax the resources and skill of the midwife. Most Associations have a wise rule by which the patient desiring the nurse's services must engage her some two or three months beforehand. This gives the midwife an opportunity of ascertaining the patient's home conditions and of making full inquiry as to her health. No conscientious midwife would care to be responsible for the life of mother and infant without ascertaining by personal inspection the conditions of the room and the sanitary arrangements of the dwelling, and taking steps to ensure the approximate healthiness of the patient.

Preparing the infant's clothing.—Much may be done to educate mothers in the management of their own health, and also in the necessary preparation for the infant, especially as regards its clothing. The superstitions and traditions connected with the lying-in period die hard among the working classes. One of the most deeply rooted is the necessity for a calico binder wrapped as tightly as possible round the unfortunate baby, and also dressing it in garments which leave the chest and back practically uncovered except for a thin calico over-

garment. The midwife can show the mother the advantage of a little knitted wool vest with long sleeves, and persuade her to purchase flannel (not flannelette) instead of calico, and not to waste her money upon elaborate and useless dresses. The garments of the Irish infants on the west coast, though wanting in elegance, are unequalled for simplicity and comfort, consisting merely of the flannel binder, a flannel jacket with long sleeves, and a long piece of flannel secured at the waist and turned up over the feet.

A district midwife is educated to be independent of ordinary appliances. She can improvise a mackintosh from the American cloth table-cover, sheets of brown paper, or even newspaper, and can keep her patient and bed in excellent order even when frequent changes of linen are not obtainable. One of the difficulties met in towns is the frequent overcrowding in houses originally intended for one family, but now let to several tenants who occupy one or two rooms on the different landings. The sanitary arrangements and water supply are naturally neither convenient nor sufficient for so many people. There is also a risk for both patient and midwife should an infectious disease develop in any family under the same roof. Even in more satisfactory dwellings there are special disadvantages incidental to town life for which the midwife must be prepared if mother and infant are to have a fair start towards good health in the future.

2. **Occasional midwifery combined with general nursing.**—Country midwifery has its own difficulties, not one of the least being often the long distances between the cases. District nurses who combine general nursing with occasional midwifery must keep strictly to the rules of the Central Midwives Board with regard to the nursing of other patients at the time. The help and co-operation of the medical men for whom the general cases are attended are most necessary for the guidance of the nurse. As a rule, country women are healthier and more normal than those living in crowded towns. The midwife will find, however, still more deeply-rooted prejudices with which to contend. The mothers and grandmothers refuse to acknowledge any treatment other than that handed down from past generations. In one county it is said that the unfortunate infants are not washed for nine days, but are rubbed with brandy instead. In another, both mother and infant are dosed with butter and sugar within a few hours of the birth, and an equally reprehensible practice is that of

giving the baby a cordial or gruel in order that it may have exactly the same as its mother. The midwife finds herself somewhat handicapped by this traditional treatment of her patients in her necessary absences, and it requires time and patience to prove that her methods lead to speedier recovery.

The necessary toilet of the mother is also beset with superstitions. A very widespread one forbids the combing of her hair for at least three days, and, if possible, for a week. This comparatively trivial operation is supposed to cause grave disaster if undertaken before the magic time has elapsed. Washing is considered highly dangerous, and many a battle must be fought before the patient and her friends realise that death will not ensue from the necessary ablutions. It requires time and patience to meet these difficulties, remembering always that should, for some unforeseen reason, any complication ensue, the way in which the toilet has been carried out will certainly be blamed, and the nurse's practice may be seriously affected.

Practical hints.—The clearly defined rules of the Central Midwives Board render it unnecessary to elaborate directions as to the nursing care for the required ten days. The midwife is held responsible for the cleanliness and welfare of her patients. She will be well advised after discontinuing to attend for the stipulated time to pay one or two visits during the next few weeks to ascertain that all is going well. This is especially necessary in securing the breast-feeding of the infant. From ignorance, laziness, or because the mother wishes to return to work quickly, the baby is weaned far too soon and then bottle-fed. It is in no small measure due to this that there is so large an amount of infantile mortality; hence the responsibility of the midwife in inducing every mother to suckle her child unless under some real disability. A careful explanation of the importance of this for the child will often induce the more intelligent to continue the breast-feeding, but the careless and ignorant woman is hard to convince that milk in any other form is not equally good. Every argument and inducement should be used to prevent the child from being bottle-fed. When this is inevitable, a bottle of the proper shape should be secured, that with the tube being absolutely forbidden. Laziness has much to do with the popularity of this shape, as it can be so easily given to the unfortunate infant, who is allowed to continue sucking it without any regard to whether it is obtaining milk or not, while the boat-shaped bottle must be

held in a proper position. Much can be done to secure adequate cleansing of the teat and feeding-bottle, for unless the mother is addicted to drink, or feeble-minded, she will not knowingly cause her infant pain and distress by neglecting their proper cleansing once she realises its grave importance.

In rural districts the question of bottle-feeding of infants is more serious than in towns, where milk can be obtained with little or no difficulty. In many counties at times fresh unskimmed milk cannot be obtained under any conditions, being sent to supply towns, or required for butter or cheesemaking; butter-milk and skim-milk are available, but not the fresh milk necessary for an infant. In some districts an effort has been made to introduce goats to supply this deficiency, but this idea has not become generally popular, and the mother either falls back upon condensed milk or, unfortunately, more often upon the various freely-advertised patent foods. Valuable advice can be given, and even a certain amount of supervision exercised, in the feeding of all infants to avoid the danger of rickets and other results of malnutrition.

All midwives and district nurses should wage incessant warfare against the dirty, unhealthy "comforter" or "dummy" teat which is at present forced upon unlucky infants by their ignorant friends and relations. It requires very little imagination to realise the unwholesomeness of perpetually sucking a piece of indiarubber, and when in addition this is allowed to fall anywhere, indoors or out, and then replaced in the baby's mouth, the danger of disease is by no means imaginary.

A nurse holding the midwifery certificate is often not required to practise as a midwife, except in cases of emergency, but is employed as monthly nurse under the medical man. Under these conditions her midwife's skill is invaluable, as frequently she has to conduct confinements in the absence of the doctor, and in any case her thorough knowledge of the work makes her more intelligent in carrying out his orders efficiently. The burden of responsibility is also removed from the nurse, and this appeals strongly to those who, while liking the actual work, yet shrink from accepting the entire management of normal cases. Midwives and maternity nurses are naturally unable to keep the usual routine as regards hours of work and rest. This is somewhat of a pitfall to conscientious workers, especially those in single districts, as they are apt to neglect opportunities of rest and become overworked and

run down. It is important for themselves, and also for the work, that midwives should secure adequate rest whenever possible. They can to a certain extent arrange the cases to secure this, and it is here that method and organisation come in. Some nurses have quite as many or more cases, both general and midwifery, than others, yet contrive to be bright and healthy, because they arrange their work sensibly. Others are over-wrought, over-tired, and never apparently able to secure rest, simply for want of a little management. Special emphasis is laid on this point, as it is here that one of the gravest temptations that can assail a district nurse may arise. When over-tired and anxious she often can neither eat nor sleep properly, even when rest time comes, and too frequently recourse is had either to stimulants or to drugs. Nothing is more insidious or fatal than thus to endeavour to secure appetite or sleep, and it becomes a positive duty for every practising midwife and monthly nurse to avoid any such danger. If the conditions of the work forbid this, she must not hesitate to appeal to the Committee for whom she is working. Those nurses who are in connection with the Queen's Institute can also obtain advice and help from the County Superintendent or Inspector. It is far better that the nurse should obtain temporary help, be given a short holiday, or even leave for a lighter district, than that she should break down in health or acquire habits which may never be shaken off, in the effort to do more than her strength will allow.

SCHOOL NURSING

A recent development of the duties of district nurses is due to the Education (Administrative Provisions) Act, 1907, under which the medical inspection of schools—a measure received with universal satisfaction by those interested in the welfare of children—is being arranged by County Councils and education authorities throughout England and Wales. The memorandum issued by the Board of Education to elucidate and put into practical shape the possibilities contained in the Act (Section 13) specially refers to school nurses as agents for the efficient carrying out of the complete scheme. The first attempt at school nursing was made about 1893 under the London School Board, and originated in the anxiety of the managers about the attendances of the children in a school situated in a slum district. It was found that they were detained at home by comparatively trivial causes, such as broken chilblains, sore eyes and skin troubles, as well as by uncleanness or when suffering

from such contagious diseases as ringworm or scabies, which prevented the teachers from admitting them with other children.

The Metropolitan Nursing Association was approached to ascertain whether a nurse could attend the school and, with the co-operation of the teachers, see to these minor ailments and also ensure that children who were obliged to remain at home should be properly cleansed and the treatment needed carried out. The suggestion took practical form, a class-room being set aside for the use of the nurse, who was provided with hot and cold water but brought the necessary dressings herself. She attended the school at a fixed hour, and all the children who were noticed by the teachers to be not well, or to be suffering from some of the above-mentioned troubles, were sent class by class to the nurse, who dealt with each one. The names and addresses of those requiring special treatment beyond cleanliness were taken, and arrangements made for them to be visited in their own homes and orders obtained from a medical man. Visiting the children in their own homes required some tact, especially when the trouble was caused by want of cleanliness, as the mothers were inclined to resent the visit of the nurse, and some considerable patience was often necessary to effect any good. Very shortly, however, it became apparent that the work was bearing good fruit: the attendances steadily improved, the visits of the nurse were looked forward to by the children, and it came to be considered discreditable to be sent to the nurse for want of personal cleanliness, a feeling amongst the children which soon reacted upon the parents. The experiment proved so successful that a school nursing association was formed by voluntary effort, which supplied nurses to many of the Board schools, and when the London County Council became the education authority of the London area the value of this work amongst the children was fully realised, and County Council School Nurses were appointed. There is now a large staff, and in 1907 a Superintendent, a fully-qualified hospital Matron, was appointed to supervise and organise the work.

School nursing has been admirably and fully developed in Liverpool. Four nurses are constantly employed in this work alone, visiting certain schools daily, while two other nurses are able to attend those within their own districts. The same methods of procedure have been authorised with regard to the application of small dressings at the schools, while the other cases needing further attention are undertaken by the district

nurses in their usual rounds. In Widnes, under the Liverpool Board of Education, the school nurse is maintained by the education authorities, and, in addition to the care of the children, is also employed to give practical health and nursing lectures to elder children and women. There are other Associations where the district nurses have been more or less occupied in this manner, although on no fixed plan ; but in connection with the Act it is more than probable that this special care of the children at school will become a distinct part of the district nurse's duty.

It is obvious that in some districts where only one nurse is employed, who, in addition to the general nursing, is responsible for midwifery or maternity cases, it would be impossible for her Committee to arrange that she should be at the disposal of the medical man for the school inspection whenever he might require her services. There are also many schools in areas without a nurse, and it would appear to be necessary, therefore, that the County Council or local education authorities should maintain a certain number of staff nurses to assist at the actual inspection of the children, and also, if there is no local nurse, to see that the required treatment is carried out in their homes. But in nearly every place where a district nurse is established, even if unable to attend the inspections, she could undertake the home treatment. Experience shows that this work diminishes rather than increases, as the nurse succeeds in educating the mothers, and at her visits not only attends to the children actually at school, but gives practical suggestions as to the cleanliness and welfare of the whole family, and thus helps in the prevention of illness and the maintenance of a higher standard of home hygiene. There is a distinct value in the children being thus seen at home by an experienced nurse, for in cases of sore throat, or of a rise of temperature, reported by her, prompt attention and isolation may prevent an outbreak of scarlet fever, diphtheria, or other epidemic disease. It is evident that in school nursing district Associations possess not only a powerful lever for the prevention of disease, but the means of promoting a higher standard of health among school children. It is not now desirable that school work should be voluntarily undertaken by district Associations ; a fair proportion of the sum required to administer the Act in each locality can be paid to each Association, either for the entire services of the nurse or nurses, for attendance on the medical inspector, and subsequent home care of the children, or for the home attendances only at a fixed scale of remuneration for work done.

OTHER DUTIES OF THE DISTRICT NURSE

Notification of Births Act.—District nurses are employed in certain areas to carry out the conditions of the Notification of Births Act, 1907, and here also the municipal authorities contribute towards the maintenance of the Association.

Infectious diseases.—It is not often that district nurses are required to attend infectious diseases, except in epidemics, when special arrangements are necessary to meet the emergency. The arrangements of local sanitary authorities and the provision of isolation hospitals have relieved nursing Associations of responsibility in this respect. The nurses can do much in the way of practical instruction of the friends of the patients to maintain the isolation of the cases, and to ensure that every precaution is taken to secure disinfection and also to avoid spreading the trouble.

Conclusion.—To those who live and labour amongst the people it is difficult to understand how district nursing can be looked upon as not requiring trained women above rather than below the average nursing standard. It is true, localities vary in the nature of nursing services needed, and while some districts, as in the mining and quarrying centres, call for expert surgical work, which constitutes the majority of the cases in such districts, in other districts midwifery, medical, and chronic work are the chief features.

I must repeat that if a nurse only looks upon her patients as “cases”—an unfortunate failing of many modern trained nurses—she is not wanted in district work. Technical skill alone will not make up for the want of personal human interest in the welfare of the people. Every home entered by a district nurse should be the better for her influence, not only as regards cleanliness and order, but also by the suggestion of a higher standard of life and conduct. Careful and thrifty people need the tactful recognition and appreciation of their efforts, as very often such homes are under less favourable pecuniary conditions than those of the dirty, squalid neighbours. Indirectly the nurse may be able to bring invaluable help to such persons when sickness has exhausted their resources, by interesting the right people in their behalf. Thus help is directed to those who deserve it, not to the lazy, thriftless folk who trade on indiscriminate charity.

With all its difficulties, physical and otherwise, its claims on patience,

tact, and forbearance, district nursing has the great redeeming point that it offers opportunity for winning the direct love and gratitude of the patients. "Nurse" becomes the friend and adviser of her district, and great, therefore, are her opportunities in unsuspected directions. Temperance, morality, thrift, are all included in the possibilities that lie before her. There is no need for her to lecture or to give direct teaching on these subjects any more than on questions of creed; but here and there, word upon word, line upon line, as occasion offers, she can bring her influence to bear on the side of good.

To nurses who, in addition to skilled training and love for their profession, possess love and sympathy for their fellow creatures, there is no wider field for humble, persevering efforts to raise the standard of health and morals amongst the people, and bring a higher ideal of home life to those who often only need a friendly guide to teach them to help themselves in this and other ways for their own lasting good.

CHAPTER XXVII

THE NURSING OF LIGHT AND X-RAYS, HEAT, AND ELECTRICITY CASES

BY KATHARINE BLANDFORD

LIGHT TREATMENT: Lupus—Finsen's Lamp—The Reaction—Healing—Why Nurses have to Wear Dark Glasses. X-RAYS: The Reaction—Telangiectatic Scarring. HEAT: The Greville System—The Dowsing Treatment. ELECTRICITY: Galvanic, Faradic, and Sinusoidal—The Electric Bath—Forms of Static Electricity—High-frequency Treatment.

LIGHT AND X-RAYS

BEFORE touching upon the Finsen-light treatment for lupus, we must first understand something of the therapeutic properties of light, and the nature of the disease of lupus.

Light as given off by the sun is composed of rays of various colours. This is most clearly seen by passing it through a prism, which deflects the rays in their course at varying angles, and lays them, as it were, out in a row—forming what is known as the spectrum.

We find them in the following order—red, orange, yellow, green, blue, violet, ultra-violet. At the blue end of the spectrum the rays are irritating and possess chemical qualities which render them germicidal, while the red rays merely convey heat from the source of the light. It is the **chemical** or **actinic** rays which are used in the Finsen treatment for lupus. Some action of these rays is seen in what we call "sunburn."

This variety of inflammation of the skin is followed by pigmentation or "bronzing." It is not due to the heat rays of the sun, for a severe form is caused by light reflected from a glacier, and under these circumstances the heat rays are absorbed by the ice. A powerful electric light has the same effect as the sun.

It will always be found that when the skin is pigmented the action of the actinic rays is much lessened. They do not penetrate so easily through a naturally bronzed skin or one that is temporarily sunburnt, and for this reason a patient with a blonde complexion will respond more readily to the light treatment than one with a darker complexion.

Lupus is a tubercular disease of the skin, due to the same bacillus that causes consumption of the lungs, and appearing as a small, slightly raised spot of a reddish-brown colour, with a transparent appearance usually likened to "apple jelly." The colour can never be pressed back as in most other skin diseases, but under pressure of the diascopé will stand out all the more plainly. It spreads more or less rapidly according to the resisting powers and general health of the patient.

In **Finsen's lamp** a very powerful arc light is used, produced by passing an electric current through carbons which are specially prepared (Siemens' A carbons are the best). Iron electrodes are not satisfactory.

The light is focussed to a small spot about the size of a sixpenny-piece by means of a telescope containing convex lenses made of rock-crystal. Glass cannot be used, as it absorbs a certain amount of blue rays. In order to concentrate the light in sufficient force and for sufficient length of time upon the patient, it is necessary that the heat should be excluded. This is done by filling the telescope to a depth of 12 inches with distilled water, which in its turn is kept cold by a constantly flowing jacket of water round the outside. In addition to this, the lens which the nurse presses upon the part to be treated is filled with circulating water. This not only absorbs any heat which might filter through the telescope, but is also a means by which the tissues are kept anæmic. It is of the utmost importance that the part under treatment should be rendered anæmic, as otherwise the hæmoglobin or colouring matter of the blood would absorb the blue rays before they had penetrated deeply enough into the tissues.

The doctor having decided that the case is a suitable one for light treatment, the part to be treated is first cleansed with boracic or weak perchloride lotion, and marked round with a blue skin-pencil. The patient is then placed on a couch so that the surface of the spot is perfectly parallel with the end of the telescope and about 3 to 4 inches away from it.

It is of great importance to get the light focussed at the correct size. In passing through the convex lens at the end of the telescope



Photo: Pictorial Agency.

PLATE LV.—APPLICATION OF THE FINSEN LIGHT AT THE LONDON HOSPITAL.

the blue rays are slightly more bent than the red, and so come to a focus before them. It is at this point that we want to use the light, so as to get the actinic rays at their full strength. If the surface of the spot to be treated is uneven, it should be packed round with cotton-wool moistened with boracic lotion; and should the part be near the eye, that organ must be protected by means of a pad of cotton-wool, also moistened and covered with thick brown paper, both being kept in place by a narrow bandage. A finger bandage is the most convenient one to use. When the side of the nose is treated, the nostril must be packed with wool so that a firm surface is obtained. The pressure glass is then adjusted, keeping it parallel with the end of the telescope so that the rays of light are reflected back from it into the telescope again. The light must be kept immediately within the blue circle marked with the pencil. It is most important that no rays should fall on the skin beyond that part which is in close contact with the lens, otherwise a severe inflammation of the skin would be set up. Each place is treated for one hour, during which time the pressure glass should not be removed. The lenses vary from a concave to a very convex shape, and care must be taken to choose the right glass for the spot to be treated, otherwise it will be impossible to obtain the even pressure which, as we have seen, is so essential.

The circulation of water both round the telescope and through the pressure glass is controlled by a small tap which must be fully turned on before beginning the treatment, and the nurse must see that the tubes through which this water passes are quite free, and not doubled backwards upon themselves so as to stop the flow. After the sitting is over, the pressure glass is first carbolised, and then wiped over with cotton-wool moistened with methylated spirit.

The **reaction** from the chemical rays of light does not begin, as a rule, until six to twelve hours after treatment, when some erythema and possibly blistering are seen. Actinic rays thus differ very materially in effect from heat rays, of which the effect is practically instantaneous.

By the end of the second or third day the tissues have broken down and appear like a burn of the third degree (p. 45). In all cases these wounds need very careful dressing. Immediately after treatment the blue line is removed with sesame oil, and the spot is covered with boric ointment spread on surgeon's lint. This is replaced by fresh dressing at least three times a day, until the tissues have broken down. Then some

soothing ointment is used instead of boracic, such as zinc and lanoline or hazeline cream. All particles of skin and old ointment must be removed, preferably with oil and forceps, before applying the fresh dressing, as it is important that the wounds in every case be kept surgically clean. The length of time they take to heal varies in different patients—some will have healed by the end of ten days, while others take as long as three weeks.

While treating a patient at the lamp, it is essential that the nurse should wear dark glasses, for two reasons:—

1. The light is so intense that it would be impossible to see if the right part were being kept under treatment, and also if it were perfectly anæmic.

2. The nurse would get conjunctivitis.

It is always advisable, when beginning a new case, to treat the edges of the affected part first, especially where the disease appears to be active, so that any extension of it may be prevented.

If the affected part is at all ulcerated, it will have to be treated first with boric fomentations, and then X-rays will probably be ordered so that the tissues may be healed and rendered firm enough to bear the pressure of the lens.

The **X-rays** are generated by passing an electric current from an induction coil through a glass tube from which most of the air has been exhausted. Their therapeutic property is very different from that of the actinic rays which are used in Finsen's treatment. They stimulate the human tissues, and will often heal tubercular ulceration when all other treatment has failed. Until recently it has been found very difficult to measure the dosage with any accuracy, but by **Sabouraud's pastilles** this is now done with great success. These pastilles are small yellow discs made of platino-cyanide of barium—a preparation which becomes tinted to an orange shade when it has been exposed to a certain amount of X-rays.

When a patient is about to be treated, one of these pastilles is placed near the tube, so that it receives the full amount of the X-rays given. By the time it has been coloured to the required tint the patient has received as nearly as possible an accurate dosage of the rays. It can be varied according to the doctor's orders of "plus" or "minus."

The **reaction from X-rays** first appears about six or eight days after treatment, as an erythema more or less severe, and does not entirely



Photo: Pictorial Agency.

PLATE LVI. - APPLICATION OF THE X-RAYS AT THE LONDON HOSPITAL.

pass off for a fortnight or three weeks. The best and most soothing dressing to use is hazeline cream.

The result of an overdose of X-rays is severe ulceration followed by sloughing, and it is almost impossible to get the tissues to heal. Boric acid fomentations would be ordered, and may have to be continued for many months. Fortunately it is now a rare thing to see ulceration caused by X-rays, but it was not at all uncommon a few years ago, when there were no reliable means of measuring the strength and amount given.

Nurses may frequently see some telangiectatic scarring in cases of lupus which have been treated by X-rays, and the patient invariably thinks it is part of the disease. In appearance it is like small red threads running through the affected parts in all directions. It is the dilatation of the small capillaries, and is an after-effect of prolonged or severe application of X-rays. It may begin to appear as long as six or eight months after all treatment has ceased.

The doctor will probably treat it with **electrolysis**. This is a very painful process, and, if possible, it is best to prepare the patient by putting a double piece of lint soaked in cocaine (10 per cent.) over the affected part. This piece of lint must be covered with oiled silk and bandaged on for about fifteen minutes, and will to a certain extent deaden the pain.

The current for electrolysis can be used from the main—a small switchboard only being necessary—to which the “leads” or wires along which the current passes are attached. The needle is fastened to the negative or cathode wire, and before being used is made sterile by heating it in a small lamp provided for that purpose. A metal plate covered with a case made of chamois leather is attached to the positive or anode wire, and this is held firmly by the patient to complete the electric circle. The chamois leather must always be soaked in water before giving it to the patient to hold, as this enables the current to pass more freely. Five milliampères is the amount generally used, and this must be regulated by the small resistance coil on the switchboard.

It is important always to bear in mind that lupus is a tubercular disease, and that the patient's health and general condition must be looked after accordingly. Plenty of nourishing food must be taken, especially fats of all kinds. Fresh air both through the night and day is essential, and, if possible, work in the open air.

The Finsen-Reyn lamp, brought out by Finsen and his colleague Dr. Reyn, is a newer form of lamp, and has an advantage over the older one in that a larger spot can be treated by it. Also it consists of but one telescope, and therefore only one nurse is required at a time, instead of four as with the older and larger lamp, which has four telescopes. It is worked on the same principle as the older lamp, and is most satisfactory.

Many other lamps have been brought out from time to time, but it is generally held that, so far, none has come up to Finsen's method.

The "New Quartz Lamp," which has been invented by Drs. Kuch and Kromayer, consists of a U-shaped tube made out of melted rock-crystal, in which mercury vapour is brought to incandescence by means of an electric current. The circulation of water keeps the lamp cool. It produces an intensely blue light, and very severe reactions can be obtained by this lamp in ten minutes.

Before leaving the subject of Finsen's work, it may be well to mention the importance which he attached to the treatment by red light of patients suffering from smallpox, thereby preventing "pitting" and scarring.

When we realise the different properties of the rays a little thought will make the principle obvious. It is not that the red rays do any particular good, but that the exclusion of the chemical rays prevents the irritation which causes the formation of pus. Thus, if a patient is kept in a room where the windows—and any apertures through which light might come—are covered with red curtains, the vesicles will dry up without developing into pustules, and consequently the secondary fever which accompanies the formation of pus is avoided.

This theory was propounded more than a hundred years ago, but until recently has not been extensively tried.

HEAT

Heat has been used as a means of treating the sick in one way or another since the earliest ages, but it is only of late years that its full value has been realised in a very wide field of disease.

In 1893, Tallerman discovered the possibility of using dry heat at a temperature of 250° to 300° Fahr. His apparatus is heated by gas, oil, or electricity, and produces a dark heat, as in the Greville baths.

Electricity is more generally used now as a means of giving both light

and heat baths. It has advantages over the older methods in that there is practically no contamination of the air by products of combustion. Also the heated air is not breathed by the patient, and therefore the danger of the Turkish bath and the discomfort of the ordinary hot-air bath is avoided.

In the **Greville system** the heat is generated by electricity and is non-luminous. Generators are made either for treating the whole body at once, or for local application, as to the throat, ear, eye, or any part of the limbs or trunk.

The usual temperature given is 300° to 350° F. These baths are most useful in cases of kidney disease, arthritis, gout, and rheumatism. With an electro-thermic generator of the size and shape required, the bath can be given in any place, provided there is a suitable current at hand.

The **Dowsing treatment** is the application of radiant heat and light combined. The apparatus consists of powerful electric lamps which are fitted with reflectors so placed that the rays of heat and light are thrown forward on to any or every part of the body. Each lamp is separately controlled so that both light and heat can be regulated in degree and position. The bath lasts from 30 to 40 minutes at a temperature of 370° to 400° F.

The temperature of the patient is slightly raised during this time, but quickly regains its normal height after the bath is over. The apparatus is well ventilated, so that although the patient perspires freely no vapour is formed, and the air remains dry to the end. These baths are largely used for gout, rheumatism, arthritis, sciatica, nephritis, and general affections, such as anæmia and debility.

To give a Dowsing bath, a hair mattress on an ordinary wire one is required. Over this is placed an asbestos-lined blanket, which is covered by a mackintosh, and then the muslin sheet which is to receive the patient. This sheet is wrung out of a solution of soda and dried before it is ready for use, and must be next the patient's skin. Metal bars are placed across the bed to support the covering at a sufficient height to allow of the lamps and reflectors being placed round the sides and feet of the bed.

When the patient is in position the muslin sheet must be carefully tucked round him, so that it may not be singed by the heat from the lamps. An asbestos-lined covering like the one beneath the patient

is then placed across the bars, and supported by poles at the four corners of the bedstead. Two or three blankets are put over this, and a towel is arranged round the patient's neck and face to absorb the perspiration. As a rule, the lamps all the way round are lighted, but if the patient complains of too great a heat in any one place those nearest the part are switched off.

A temperature of 350° to 400° F. can be borne without discomfort, but in all cases the patient's inclination must be consulted, and if any discomfort is shown, the heat must be lessened. The bath should last from 20 to 40 minutes, during which time the nurse should not leave the room. The patient may complain of palpitation or faintness, which would necessitate the treatment being stopped; but with radiant heat this is very rarely the case.

After treatment the patient must be rubbed all over with a warm towel. He may then dress himself, and should wait for fifteen or twenty minutes until he is cool and able to go home.

These baths must not be given soon after a meal. They will probably be ordered two or three times a week, or in some cases every day, until improvement takes place.

A method of using electricity in the local application of dry or moist heat has been invented by Cerruti. Very fine metallic wires are woven into specially-prepared cloth, and an electric current is passed through them, raising them to the required temperature. This pad can be placed directly in contact with the skin when dry heat is required; or it can be used as a fomentation by placing a piece of damp lint between it and the patient. The pad can be evenly heated throughout, and maintained at a uniform temperature.

ELECTRICITY

During the last few years electricity has come very much to the front as a therapeutic and diagnostic agency. One of its greatest uses is as a stimulant, either local or general, and whether applied to the internal viscera, muscles, and nerves, or to the external tissues.

It is used also to alleviate pain, as in neuralgia, to generate heat and light for different kinds of baths, and to test muscular and nervous reactions, as well as for electrolysis and many other things.

Electricity may be **static** or **current**. The former is produced by friction, as in the Wimshurst machine, and is used chiefly for

nervous disorders; the latter is derived either from a battery or, as is more usual now, direct from the main current supplied for lighting purposes.

The two chief kinds of current electricity are known as "galvanic" and "faradic," after the respective discoverers. The *galvanic* is a continuous current, and it flows always in the same direction—from the positive to the negative pole. The *faradic* is "interrupted," that is, the current is made and broken in rapid succession, generally from 50 to 100 times a second. The direction of this current is constantly changing, so that there is little or no difference between the two poles.

A third kind of current which is much used for electric baths is called the *sinusoidal* current. This is similar to the faradic in that it is interrupted, but it is gentler and more even.

Before going further it will be well to describe the use of the **switch-board**. On it will be found the two terminals, the positive marked + and the negative marked —, to which are attached the wires or "leads," as they are called. These wires are covered with silk or cotton. Both of these are non-conductors and act as a safeguard against an electric shock should the operator touch the wires while the current is on. The electrodes to be used are fastened to these wires. The *indifferent* electrode is merely used to form a connection between the patient and the second wire, and so complete the electric circle. It is usually made of a plate of metal, covered with wash-leather or flannel. The nurse must see that this covering is always well moistened with water before beginning the treatment, so that the natural resistance which the skin offers to the current may be overcome.

The *active* electrode is made in many different shapes and sizes according to the method of treatment and the part to be reached.

It is most important that the patient should not come in contact with the metal part of an electrode, or he may be severely burned. The nurse must therefore see that it is completely and efficiently covered.

The **ammeter** is a small dial which registers the number of ampères passing. When the continuous current is sent directly through the patient, from five to ten milliampères is the usual strength used. A milliampère is the thousandth part of an ampère.

The **resistance coil** is made of fine wire, and is so called because of the resistance it offers to the current. The finer the wire, the greater

will be the resistance. By moving a slide along this coil the strength of the current can be regulated by bringing into play more or less of the wire. There is also a small handle which can be moved backwards and forwards between two studs marked "N" and "R," *i.e.* normal and reversed. By this the direction of the current is reversed when desired, without moving the electrodes from the patient's body. When the handle is over "N" the current is coming from the positive wire and returning through the negative in the usual way. If it is to be reversed, the handle is placed over "R," and then the negative wire is the one through which the current comes, thus turning it into the positive for the time being.

The nurse must thoroughly understand the difference between the **anode**, or positive pole, and the **kathode**, or negative pole, so that anodal or kathodal treatment, when ordered, may be correctly carried out.

The continuous current always passes from the positive to the negative pole, and, if **anodal treatment** is ordered, the electrode to be used must be attached to the anode wire, while the indifferent electrode, which is merely used to conduct the current back again from the patient, is attached to the kathode wire.

If **kathodal treatment** is ordered, the two electrodes must be changed over, the one that is in active use being fixed to the kathodal wire, and the indifferent electrode to the anode.

Should any doubt arise as to the identity of the poles they may be tested in one of the following ways :—

(a) Put the ends of both wires into a basin of water, and immediately innumerable bubbles will be given off from the kathode wire, whilst only a few will be formed round the anode.

(b) Place both wires on a piece of damp blue litmus-paper, and where the anode wire rests it will turn red.

The indifferent electrode is usually placed on the chest or back or under the sacrum of the patient, unless for electrolysis, when the patient holds it in his hands.

The nurse must see that the connecting screws are quite firm, so that the current may pass steadily and surely, otherwise an unpleasant shock may be caused.

One of the best and pleasantest methods of applying electricity is by the bath, and this can be given either generally or locally. The **electric bath** is largely used as a nerve tonic in general debility, for

anæmia, rickets, and malnutrition, for paralysis, rheumatism, and gout.

Water is a good conductor, and therefore, if a patient be immersed in it, the natural resistance that the skin offers to the current is at once overcome.

An ordinary earthenware or porcelain bath is used.

The electrodes are usually in the form of large copper plates placed at the head and foot of the bath, and these must be kept bright—not only for appearance sake, but because dirty metal is not a good conductor. They are sometimes covered with rubber mats to avoid the possibility of contact with the patient, or a wooden back-rest is provided with webbing straps against which the patient leans. This is fixed well down in the bath in front of the electrode, with a similar protection for the feet.

The current passes through the water from one electrode to the other, the patient only receiving a small percentage. The temperature of the bath should be about that of the human body or a little higher, and should be tested with a thermometer. An ordinary bathing dress is the most convenient covering, and when the patient is ready he must get into the bath *before* the current is turned on. This must always be done very gradually, until the full strength is reached, so that it may cause no shock to the patient. The amount of current used depends to a great extent on his feelings and inclinations. The doctor will allow no discomfort to be caused, and the nurse must watch the ammeter to see that the current runs evenly.

Treatment is usually continued from ten to twenty minutes, and the current must then be turned off as gradually as it was turned on. It is most important that the current should not be altered suddenly.

If the patient feels faint or ill whilst in the bath, the nurse must lessen the current or turn it off altogether. After being dried, the patient may be allowed to dress himself slowly, and should then rest for fifteen or twenty minutes before going home.

Baths are usually given two or three times a week, for a month or longer. It is important that they should not be given soon after a meal.

Local baths for the upper or lower limbs are given in small but deep baths made for the purpose. The same precautions must be taken as in the general bath.

When a bath is not practicable, **general electrification** may be carried out by the following method :—

The patient is placed on a large metal plate, which acts as one electrode. This is covered with wet flannel. The other electrode is held by the nurse, who passes it over the body as directed ; or she may hold it in one hand and use the other as an electrode, letting the current pass through herself first.

If the treatment is specially for the nervous system, one electrode is placed on the chest, while the other is moved over the head and spinal column. Before the head is treated the hair must always be made wet. The nurse should in every case test the current by trying it on herself first.

If *stable treatment* is ordered, the active electrode must be kept still over the one part. If *labile treatment*, the electrode is moved slowly backwards and forwards for the required length of time without taking it off the patient. In *bi-polar treatment* the two electrodes are placed close together.

For **static electricity** the *Wimshurst machine* is the one most widely used. It can be worked by hand or by an electric motor, and consists of a number of large glass discs in pairs, and enclosed in an air-tight case. When set in motion the discs revolve in opposite directions, generating an electric current which collects at one of the two metal bars in the front of the machine, and which are known as the conductors. To insulate the patient he is placed on a low platform with glass legs.

For simple charging the patient sits on the platform and is connected with one of the poles, the other being “earthed,” which means that the current is allowed to escape to the earth by means of a brass chain usually fixed to a hook on the leg of the machine.

When the prescribed time is over the machine is stopped, and the current quickly exhausts itself.

The charge and discharge are carried out by bringing an earthed ball-electrode sufficiently near to the pole from which the patient is being charged to allow of sparks passing between the two. In this way the patient is discharged as the spark passes, to be immediately charged again from the machine.

Other modifications of static treatment are—

(a) The *electric breeze*, given with an earthed many-pointed electrode.

The nurse must here be careful not to hold the electrode near enough to the patient to induce sparks.

(b) *Electrical sparks*.—For this an earthed knob is used, and as only one spark should be allowed to pass at a time—and this at the place ordered—some practice is needed to carry it out accurately.

It is done by passing the knob in a curved direction towards the part to be treated, so that the spark escapes at the greatest bend of the curve.

If the patient feels this too much, the strength can be modified by the nurse putting her foot on the platform, and so allowing some of the current to pass. Care must be taken not to allow sparks to pass to any sensitive organ of the body or over any prominent bone.

Static electricity is usually given for nervous debility of all kinds.

The **high-frequency treatment** is another method of general electrification, and is so called from the immense number of interruptions produced in the current every second.

To apply it in the direct method, the patient is merely connected by the two electrodes as in faradism.

For condensation the patient must be on a couch, one electrode being placed underneath the mattress while the other is held in the patient's hand.

For local application different electrodes are used. In some cases a metal brush is employed, which is held quite close to the patient; in others a closed glass tube, from which the air has been partially exhausted, or which has been filled with water—both methods of conducting the current. This should be kept in actual contact with the affected part, unless a severe effect is desired.

High frequency is employed generally for rheumatism, gout, or general debility, and locally for diseases of the skin and mucous membranes.

For muscle-testing it is necessary that the patient's limb, or that part of the body under examination, should be bare, and in a good light, so that the slightest contraction may be seen. The muscles must be completely relaxed, and the skin moistened. If the legs are to be tested the patient must be on a couch. The indifferent electrode should be fairly large, and placed on the chest or back, unless the hands or feet are being tested, in which case it should be on the side opposite to the active electrode.

A bowl of water must be at hand for moistening the electrodes.

The contractions are spoken of as A.C.C., anodal closing contraction; A.O.C., anodal opening contraction; K.C.C., kathodal closing contraction; and K.O.C., kathodal opening contraction. "Closing" and "opening" respond to the making and breaking of the current.

Electrolysis is sometimes used as a means of introducing drugs through the skin, when it is spoken of as cataphoresis. It is also used for the removal of moles, nævi, and superfluous hairs. When a large nævus is being treated a general anæsthetic is necessary on account of the pain.

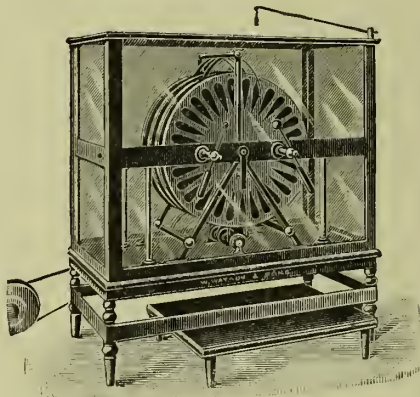


Fig. 80.—EIGHT GLASS-PLATE WIMSHURST STATIC MACHINE IN CASE. (MESSRS. WATSON.)

CHAPTER XXVIII

THE NURSING OF NERVOUS DISEASES

BY R. S. WESTON

General Considerations—Paraplegia and Hemiplegia—Infantile Paralysis—Locomotor Ataxia—Bell's Palsy—Acute Rheumatic Neuritis—Sciatica—Trade Spasms—Infantile Convulsions—Epilepsy—Chorea—Neurasthenia—Hysteria.

THE nursing of nervous diseases makes a very heavy demand upon the solid knowledge and experience of a trained nurse, and much of this knowledge can only be obtained by working in a hospital specially set apart for the treatment of such cases. Not only are intelligence and good training necessary, but much courage, patience and fidelity, if anything like a high standard is to be maintained. The more inferior and superficial the nurse the less able will she be to recognise the wide field thrown open to her, but the really keen, intelligent woman will soon awaken to her opportunities.

The list of nervous diseases is a long one and gives ample scope for study and professional interest, besides opportunities for the best of nursing. Organic disease of the brain and various diseases of the spinal cord are responsible for many forms of paralysis. Affections of the neuromuscular mechanism, such as sciatica, neuritis, plumbism, and facial palsy, also the more serious diseases of myasthenia gravis and acute poliomyelitis, all call for protracted and special treatment, and for good practical nursing. But it is by her success in aiding to bring the victims of functional diseases back to a normal condition that the highest type of nurse may be judged. It is essential that a nurse or Sister in charge of patients afflicted with nervous disorders should be a competent masseuse and have a good knowledge of electrical therapeutics, as she will be called upon to administer these treatments daily, and a complete training in all branches of surgical nursing, including the use of aseptics, is a *sine quâ non*, for she may have to prepare patients for and assist at such

important operations as removal of cerebral tumour, laminectomy, torticollis, etc. Even an acquaintance with the technique of ophthalmic surgery and nursing may be useful, for operations upon the eye may be added to the list.

In short, it will be seen that it is necessary that a nurse undertaking the care of patients suffering from nervous diseases should have had a thorough preliminary training in both medical and surgical nursing, and have passed a satisfactory examination in massage and in the application of electricity as a healing medium. And yet, having acquired all this, she may still be a failure in this particular branch of nursing unless she have certain personal qualifications which are as important as any of those already mentioned. Tact, quick sympathy, cheerfulness, and kindness, firmness without harshness, an even temperament and moral backbone, are needed by the woman who will live among and help to heal these patients, whose minds are often as warped and wilted as their poor bodies. It cannot be disputed that a nurse who undertakes this special work, and does it well, is an honour to her profession.

To deal with the practical nursing of these patients, as differentiated from ordinary nursing, it will be convenient to divide them into two classes—(i.) organic diseases of the nervous system, (ii.) functional disorders; and, selecting some of the most common cases of these classes, to deal with the symptoms and nursing of each.

I.—ORGANIC DISEASES

PARAPLEGIA AND HEMIPLEGIA

Paralysis may occur from either brain or spinal trouble. It may also be associated with, or appear as a sequel to, diphtheria, typhoid, and other fevers. Yet another form is functional paralysis, which must be considered among the complaints of Class II.

Symptoms.—Paralysis due to brain disease, such as cerebral tumour, cerebral hæmorrhage, or an abscess of the brain, generally affects one side of the body only: this is hemiplegia. That due to spinal disease usually affects both sides of the body below a certain level: this is paraplegia. Sensation in hemiplegia is frequently unaffected, but in paraplegia there is often anæsthesia of the paralysed limbs. Either of these forms of paralysis may have a traumatic origin, resulting from an injury to skull or spine.

Nursing points.—Although these may be considered quite everyday sort of cases, they nevertheless demand constant care by day and night. The paralytic patient, always more or less helpless, depends entirely upon the nurse for every change of position, for washing and feeding and for other attentions, which, if neglected, may lead to serious consequences. Where there is incontinence the risk of bed-sores is increased, although it is possible that they may ensue without this complication if due care is not observed. When incontinence is present, the bed should be made up with a long mackintosh under the bottom sheet to prevent the mattress becoming wet, and a smaller mackintosh should be placed across the bed beneath a draw-sheet of thick Bolton sheeting. Linen or calico draw-sheets are not advisable, being less absorbent and very cold when wet. If the patient be very emaciated, a water-pillow beneath the lower part of the spine generally proves a source of comfort and relieves pressure, and in some cases an entire water-bed may be necessary. The draw-sheet should be changed as a matter of routine at least three times a day, and of course at any other time if wet or soiled. At each time of changing the sheet the back should be carefully washed with plenty of soap, which should not be rinsed off before gently drying, as the soap hardens the skin and gives it elasticity. Methyated spirit well rubbed in with a circular movement of the hand is also stimulating, and an application of zinc ointment will prevent the urine from having an irritating effect upon the skin. With patients whose speech is affected, an increased restlessness or attempt to get out of bed will often indicate a desire to pass urine, and a quick observation of such small symptoms may frequently save the nurse time and trouble, and the patient much discomfort.

Care should be taken to keep the feet and legs warm, but every precaution must be observed when putting hot-water bottles into the bed of a paralysed patient, as severe burns may result without any warning of pain, owing to the anæsthetic condition of the injured portion of the body. Such burns are most tedious and difficult to heal, because of the unhealthy condition of the tissues. When there is incontinence of both urine and fæces, if the doctor permit, an injection of soap and water given every alternate evening instead of an aperient, will help to save much soiling of sheets and be of material assistance in preventing bed-sores.

When the patient is completely bed-ridden and helpless, there is always a tendency to develop pressure sores on the heels, ankles, shoulder-

blades and knees, and constant attention and often some ingenuity must be exercised to avoid their occurrence. Rings of amadou plaster or ring pads of soft calico stuffed with tow and cotton-wool are often useful to relieve pressure, but the skin must be treated in the same manner as previously mentioned for the back.

Massage and electricity.—At the present day massage and electricity enter largely into the treatment of almost every form of paralysis. Active treatment is not usually ordered until a short time after the onset of the trouble, but when the general symptoms have subsided the sooner it is begun the better. The massage must be of the gentlest description to commence with, and not be given for more than five minutes at a time. In a case of hemiplegia most attention should first be given to the hand and fingers, with only light effleurage movements to the arm. Light pressure movements may follow, succeeded in a few days by passive movements. If all goes well, the masseuse may proceed to percussions by about the end of the second week. After three weeks, or when passive movements have been given for four or five days, the patient should be encouraged to practise active movements for a few minutes three or four times daily, by grasping light articles, by writing with a pencil, or by using the affected limb to feed himself with, but should not be allowed to over-tire himself. The nurse must take every precaution to avoid chilling her patient by exposure during treatment, using a blanket for the purpose, and the limb should be swathed in flannel or cotton-wool from the commencement of the attack.

The electrical treatment must be given strictly according to the orders of the physician. Galvanism or faradism may be chosen. Local electric baths may follow with the galvanic, faradic or sinusoidal current.

ACUTE POLIOMYELITIS, OR INFANTILE PARALYSIS

This affection usually attacks children during the first three or four years of their lives.

Symptoms.—The symptoms are a general indisposition, rise of temperature, pain and loss of power in the affected limb. The disease itself is a localised inflammation of the spinal cord affecting the motor areas, and has lately been attributed to a micro-organism, although the actual microbe has not yet been discovered.

Nursing points.—In the acute stage the patient must be kept in bed, and a purge is usually given. The paralysed limb should be wrapped

in cotton-wool, as warmth is most essential. Mustard poultices or mustard plasters are sometimes applied to the spine, the child being made to lie on his face or side.

As soon as the acute symptoms have subsided massage may be begun and a nourishing diet given. Electrical treatment has proved to be of the greatest value in this disease, although great patience and perseverance are required as it may be years before improvement is shown. The earlier the child is taken in hand the better, but even though treatment has been neglected for years, there is a possibility of improvement. Improvement first shows itself by a better circulation, and chilblains and sores commence to disappear.

In applying electricity to children great care must be taken not to alarm them by shocks, and the current should never be so strong as to frighten them or make them cry. The lower limbs are more often paralysed than the upper, and when both legs are affected an electric bath is usually ordered in which the child may be sat, clothed in a short flannel jacket or long-sleeved vest, the electrodes connected with the battery being suspended at the two ends of the bath, which has previously been filled with warm water. The current should be tested by putting both hands in the water, one at each end of the bath. It may be very weak at first and be gradually increased in strength.

A bath of this description may very easily be given at home, using an ordinary wooden tub or an earthenware foot-bath for the purpose. The nurse or mother should be carefully taught how to use the battery and to place the electrodes. The faradic current is the simplest and the most suitable for home use.

LOCOMOTOR ATAXIA, OR TABES DORSALIS

This is a slow, chronic inflammation of the spinal cord, confined to the sensory area, which produces an impaired cutaneous sensibility and loss of the power of co-ordinate movement.

Symptoms.—During the first stage the patient may suffer from sharp, shooting pains in the legs, known as “lightning pains,” and from sensations as of the limbs being tied tightly round with cords, which are called “girdle pains.” The sight often becomes affected, and the pupil may contract during accommodation but will not re-act to light. This condition is known as the Argyll-Robertson pupil. Another symptom is the absence of the knee-jerk. Signs of loss of

co-ordination next appear ; the patient may fall if he turns quickly, or stagger when bending to wash his face, and the characteristic walk gradually develops. There are attacks of gastric pain and vomiting, and in the last stage the patient becomes completely bed-ridden. Tabes is a very slow disease, and there may be only the first symptoms for a number of years ; even after becoming quite paralysed the patient may live a long while, eventually dying from some secondary cause, such as pneumonia.

Nursing points.—Though unfortunately tabes cannot be cured, much may be done to mitigate and relieve the trouble. When the pains are very severe the patient is kept in bed and blisters are sometimes ordered to be applied. Salicylate of soda and antipyrin are often given, and morphia when nothing else answers, but this is generally kept as a last resource. A mustard plaster to the gastric region may relieve the vomiting attacks. The nurse must be careful to observe and report any retention of urine. Massage and electric baths have a very beneficial effect upon the general health in these cases, and the ataxia may be immensely improved by carrying out Dr. Frenkel's method of systematic and graduated exercise, the object of which is, by the careful repetition of certain movements, to regain a more or less normal mode of locomotion and control of the body and limbs.

Dr. Frenkel is the medical superintendent of a sanatorium in Switzerland, where tabetic patients are received and treated on his system for months at a time, under the best conditions, but the exercises are so simple, and require so little apparatus, that it is quite possible to carry them out in an ordinary hospital, or even in the patient's own home. Some of these movements for the exercise of the lower extremities are practised in a recumbent position, with or without apparatus, some take place with the patient in a sitting position, while some are executed standing, and yet others consist of the different movements and actions of the limbs when walking.

Tabetic patients always require to follow their movements with their eyes, owing to the sensibility of the skin, muscles, joints and bones having become more or less impaired, so that the sense of sight must convey to their minds all those sensory impressions necessary to normal physical actions, which in the healthy would be derived from several sources. For example, owing to the loss of sensation in the soles of the feet, a person suffering from tabes, without the aid of sight, would be unable to



Photos: Pictorial Agency

PLATE LVII. EXERCISES FOR LOCOMOTOR ATAXY.

IN THE UPPER FIGURE THE OBJECT IS TO TEACH THE PATIENT TO PLACE THE FLEXED LEG ACCURATELY; IN THE LOWER, TO RE-ACQUIRE THE POWER OF CO-ORDINATION.

tell whether he stood upon a carpet or upon a slippery surface; his movements therefore become uncertain when the eyes are closed. These exercises, then, must always in the first place be practised with the eyes open and attentively watching each movement. Later on, when each detail has been thoroughly grasped, the patient may begin to practise the same thing with the eyes closed. In slight cases this advancement may be made in a week or two, in severe cases it may be necessary to wait several months.

Of course all these exercises must be carried out entirely under the doctor's orders, the nurse's principal duties being to instruct the patient in the correct routine, to teach him to make all the movements slowly and to prevent his getting over-fatigued. To give some idea of the way in which these exercises for the lower extremities are carried out in the recumbent position, one or two examples may be quoted. The patient should lie on his back with the body in a sloping position, and the head raised so that he may be able to watch every movement. The legs in the first position should be lying side by side and fully extended.

Exercise I.—Flexion of one leg in the knee and hip joints, followed by extension.

Exercise II.—Repeat first movements, abduction and adduction of flexed leg; extension.

Exercise III.—Flexion of one leg in knee and hip joints, but only to one half the angle; extension.

Exercise IV.—Same repeated, followed by abduction and adduction; extension.

Exercise V.—Flexion of the same joints, making a voluntary half during flexion.

These exercises are but a few of many, and may be practised later on with both legs at once. At first it is better to make the patient practise one leg at a time, and he must be taught to do every movement as slowly as possible, for the tendency is always to be too quick and jerky. The more slowly and evenly the exercises can be done the greater is the improvement.

There are yet other exercises which may be performed in bed with the aid of special apparatus. One of these is a board containing a number of round holes which slides on an extension frame. This is laid on the foot of the bed and the board is pushed upwards along the extension until the upper edge is level with the buttocks of the patient. The exercises

consist in placing the heel into one hole after the other upwards and downwards, then into alternate holes or into holes at different intervals ; later on, of the same movements with both legs at once, and as a further advance, with the eyes closed. The nurse should keep a daily record of the exercises which have been done, and of the progress the patient has made.

Other exercises are for sitting down, getting up, walking and turning round, and for ataxia of the upper limbs. The accompanying illustrations (Plates LVII., LVIII., LIX.) show some of the many positions which a patient assumes in the practice of such exercises.

A word may be said as to the great care necessary in giving passive movements to these patients, for serious injury may be done because the warning note of pain is absent. Fractures and muscular injuries have been known to occur from too vigorous handling. In carrying out the walking exercises it is most important to avoid as far as possible the risk of falls.

NEURITIS

There are several neuro-muscular diseases attacking the peripheral or external nerves which call for very similar treatment and nursing. Neuritis, to begin with, may affect only one nerve, or several may be involved. Multiple neuritis results from a poisoning of the whole system, and under this head come alcoholic neuritis, post-diphtheritic paralysis, and lead palsy ; the two latter paralyses being consecutive to a general poisoning and multiple neuritis. Inflammation of a single nerve may result from cold, injury or pressure, or from some inflammation in the locality, which may spread to the nearest nerve. The symptoms of neuritis of a single nerve are pain along its course, with sensations of numbness and tingling, and sometimes an outbreak of herpes. There is usually acute pain on movement, with some muscular atrophy, and twitching of the muscles may be present.

Bell's palsy.—Inflammation of the facial nerve which causes paralysis of one side of the face is known as Bell's palsy. It may arise from cold, disease of the ear, or lesions at the base of the brain. The loss of muscular power causes inability to wrinkle the brow, to close the eye, and to move the mouth on the affected side ; there may also be some difficulty in eating, from the weakened buccinator muscle allowing the food to accumulate between the jaw and the cheek.

When facial paralysis is supposed to result from cold, hot applications



Photos: Pictorial Agency.

PLATE LVIII.—EXERCISES FOR LOCOMOTOR ATAXY.

IN THE UPPER FIGURE THE PATIENT IS PRACTISING RAISING THE LIMB SLOWLY AND EVENLY; IN THE LOWER HE IS PLACING THE HEEL IN THE FIRST GROOVE OF THE FRAME.

of either moist or dry heat are generally ordered, and a blister is sometimes applied behind the ear. A purge is also given. When the acute symptoms have subsided massage and electrical treatment usually follow. Where the symptoms are accompanied by a discharge from the ear an operation is often necessary to let out the pus which is the primary cause of the neuritis.

Acute rheumatic neuritis of the arm is a very severe trouble, and may cause excessive pain. The patient may have a considerable rise of temperature and the slightest movement will bring on a paroxysm of suffering. In such a case the doctor may put the limb on a splint in order to secure absolute rest, and it may be necessary to keep the arm in a sling for some weeks. During the acute stage the patient would be kept in bed. Blisters or soothing liniments may be tried to relieve pain, and salicylate of soda may perhaps be ordered until the temperature comes down. The bowels should be kept well opened and when the acute symptoms have subsided the nurse must give the patient plenty of light, nourishing food. Alcohol of course must be avoided. Later, massage and passive movements, combined with electrical treatment, are most useful in restoring muscular tone and strength. Local arm baths with the constant current have very soothing and satisfactory results.

Sciatica.—Inflammation of the great sciatic nerve is only too well known as a most painful and persistent condition. The exciting cause may be a strain, cold, gout, rheumatism, syphilis, or pressure, as from a growth in the pelvis, or occasionally from chronic constipation.

The chief symptom is pain, which may be of a shooting kind, or a burning throbbing sensation which is made worse by movement. The pain may come in paroxysms with intervals of relief, or suffering may be continuous, only varied by being sometimes more acute. There are tender points along the course of the nerve which are painful to the touch.

Nursing points.—This is a most obstinate disease, and often resists every form of treatment. In a severe case the patient would be kept entirely in bed, and the leg is sometimes put up on a long splint. The treatment usually varies according to what is believed to be the exciting cause of the disease. For instance, where there is a strong rheumatic tendency, salicylate of soda may be given; if syphilis be suspected, iodide of potassium or of sodium would probably be prescribed. Warmth is very necessary, and for very acute paroxysms leeches are sometimes applied to the upper and back part of the

thigh. Blisters and other forms of counter-irritant often give relief, and, when the acute stage is over, massage and electric baths are most beneficial. The choice of current may have to be determined by what best suits the case, as one patient may do well with the induction coil and another will progress better with the constant current. The sinusoidal current will sometimes give relief when all other forms of electricity have failed.

In confirmed cases of sciatica surgical aid is sometimes needed, and the nerve is then cut down upon and stretched. Sharp steel needles thrust into the nerve, and the injection of distilled water into the nerve sheath, are other methods employed.

TRADE SPASMS

Among neuro-muscular diseases may be mentioned a spasmodic condition of certain groups of muscles which is involuntary, and may be so severe as to prevent the patient from continuing his ordinary occupation. These so-called trade or professional spasms are met with among writers, musicians, telegraph-clerks, and others, and are the result of over-fatigue from constant repetition of the movements of the affected parts. There is often a dull, aching pain as well as the active spasm which occurs when an attempt is made to work. It is generally found that the patient is in a poor condition of health when these attacks seize him, so that in addition to local rest complete rest in bed may be essential. Rest and good feeding, combined with massage and local electrical treatment, are the doctor's usual orders for these cases.

INFANTILE CONVULSIONS

may occur from birth to the end of the second year, and congenital cases may result from meningeal hæmorrhage caused by a difficult labour, and the use of instruments. Meningeal hæmorrhage is usually followed by more or less severe hemiplegia, and as the child develops it may be found to be mentally deficient, or perhaps unable to stand or even to sit up. Meningeal hæmorrhages may also be induced in young children by the strain of coughing in whooping-cough and bronchitis, and convulsions may occur at the commencement, or during the progress, of several acute diseases, such as measles, scarlet fever, and pneumonia. There are many other predisposing causes. Fright, teething, worms, an overloaded stomach, falls or blows upon the head, may bring on an



Photos: Pictorial Agency.

PLATE LIX.—EXERCISES FOR LOCOMOTOR ATAXY.

IN THE LOWER FIGURE THE PATIENT IS PRACTISING PLACING THE HEEL ON THE SUMMIT OF THE FRAME;
IN THE UPPER THE POSITION IS ASSUMED TO RE-ACQUIRE A NORMAL GAIT.

attack of convulsions in older children. Most of the convulsive attacks occurring during dentition are the result of digestive irritation, and these fits do not generally recur if the cause be removed.

There are often some premonitory symptoms before a fit, such as restlessness, grinding the teeth when asleep, and twitching of the muscles of the face. When the attack actually begins the child gives a loud cry and becomes unconscious, his body and limbs becoming quite rigid. The eyes are rolled upwards and fixed, the face pale, afterwards turning livid, and the breathing stops. This stage is followed by the active convulsions, during which the face is drawn and contorted, the eyes roll, there is frothing at the mouth, and the body, arms and legs are thrown about. In the third stage the patient passes into a stupor which is longer or shorter according to the severity of the attack. If several fits follow in succession the patient may die from exhaustion or suffocation.

Convulsions may occur at almost any age from other causes than those already mentioned, such as puerperal convulsions, which are associated with child-birth, uræmic fits, which may accompany kidney disease, and the convulsions which are produced by ptomaine poisoning.

Nursing points.—During convulsions, whether of an infant or of an adult, the first thing the nurse must do is to place the patient in a recumbent position with the head slightly raised, loosening all clothes about neck and chest. If the patient be not an infant something must be slipped between the teeth on one side to prevent the tongue from being bitten. A cork, a knotted handkerchief, or a paper-knife will answer the purpose if an indiarubber ring be not at hand. The movements of the body and limbs should not be too much restrained, but care must of course be taken to prevent the patient from hurting himself. With infantile convulsions, pending doctor's orders the child may be placed in a warm bath for a few minutes, and then wrapped in a blanket. Where several attacks follow in succession, the doctor may possibly administer chloroform, though this is not usually given to very young children.

The after-treatment will entirely depend upon the probable cause of the attack. Sedatives, such as bromide of potassium and chloral will probably be ordered, and where there is difficulty in swallowing these may be administered *per rectum*.

II.—FUNCTIONAL DISEASES

EPILEPSY

is a disease of the nervous system in which convulsions may or may not be present. The disease has three forms—*petit mal*, *grand mal*, and Jacksonian epilepsy.

With *petit mal* there is loss of consciousness for a brief space of time, but there are no convulsions. The unconsciousness may be so short that the patient may only pause for two or three seconds between the words of a sentence and then continue speaking as if nothing had happened. The face is pale and the eyes are fixed. This form of attack may occur frequently and gradually develop into the second stage.

Grand mal is loss of consciousness, accompanied by general convulsions. The attack is often preceded by sensations which warn the patient that a fit is coming on. The aura, as it is called, may be a numbness or tingling of the extremities, ringing in the ears or flashes of light; the patient then gives a loud scream and falls heavily, without any attempt to save himself.

The fit is in three stages, much the same as those already mentioned in connection with convulsions arising from other causes, and the treatment during the attack should be carried out in the way already described, with this addition—that when the second or convulsive stage is over, the patient's head should be turned on one side with the tongue drawn forward to prevent it from covering the larynx and so causing death by suffocation. When fits occur in rapid succession the period of coma may be more or less prolonged, and death may sometimes result after several consecutive attacks. Epileptic fits may take place during sleep, the patient being quite unaware of what is happening, although on waking he may have a very tired feeling, with pains in the head, back and limbs, and his frame of mind may be either excited or depressed. In some cases of this kind urine is passed involuntarily in bed.

Jacksonian epilepsy, the third form of the disease, is usually caused by some injury to the skull which produces brain irritation, or by the pressure of a tumour on the motor area of the brain. In this variety of epilepsy the patient does not always become unconscious, and the convulsions are limited to one region of the body. After a fit a patient may sometimes go about in a semi-unconscious condition, and during this state of mental aberration he may commit actions of which he has after-

wards no recollection. The general health of epileptics is usually inferior, and they are very easily excited or depressed. There is often great irritability of temper, especially when an attack is coming on.

Nursing points.—Dieting is most important in epilepsy. Meat is generally forbidden, fish taking its place, and all other food should be light and nourishing. Meals have to be taken regularly, and the quantity of food should be moderate. Alcohol should be avoided. Constipation must be carefully guarded against. The drugs which are prescribed in the treatment of epilepsy are the bromides of potassium, sodium and ammonium. They may be ordered separately or all three combined, and are sometimes given for many years, the usual rule being that the medicine is not discontinued until the patient has been free from an attack for at least two years.

The nurse must look out for any symptoms of drowsiness, dyspepsia, or heart weakness while these drugs are being given, in which case the dose would probably be reduced. A "bromide rash" may also appear in the shape of pimples resembling acne. Arsenic is usually added to the prescription when this arises.

Epileptics require very careful management, and great tact and kindness, combined with firmness, are needed by those who have charge of them. Jacksonian epilepsy resulting from an injury to the skull, or from a tumour of the brain, may be relieved by a surgical operation, the object being to remove the pressure. A special chart has been designed for keeping a record of the number of fits which a patient may have.

CHOREA

"St. Vitus's dance" is an acute nervous disease, and is most common in children between the ages of five and fifteen years. Girls are more subject to it than boys. An attack may be induced by over-study or shock, or it may come on during or just after acute rheumatism. The children of neurotic parents are more liable to chorea than others. The first symptoms are restlessness, twitching of the face, or protrusion of the tongue, with fidgety movements of the limbs, and twisting of the whole body. The patient's muscular actions become jerky, and there is a tendency to drop things. In bad cases all movements become so exaggerated that the patient is unable to dress or feed herself. The average length of an attack is two months, and the patient requires unflinching care and skilful nursing all the time.

Owing to the friction caused by constant restlessness, sores may develop all over the body, the hair often being quite worn off the back of the head through continual rolling to and fro. These sores are most difficult to prevent, and when they occur must be treated with surgical cleanliness, or they may prove a source of serious danger. Knees, elbows, and ankles should be bandaged up with pads of cotton-wool, which will prevent sores on these bony parts, and all the usual precautions against bedsores must be scrupulously carried out. Some medical men order restraint of the violent movements by bandaging the legs together, the arms being bound to the sides, and a folded blanket fastened across the abdomen and hips to keep the body down.

Other complications of chorea are impairment of speech and sensation, difficulty in swallowing, loss of control over the evacuations, and cardiac trouble.

Nursing points.—Broadly speaking, the basis of all treatment of this disease is to improve the nutrition of the body by sufficient and suitable food, rest, and warmth. Feeding is therefore a matter of the greatest importance, and one which depends greatly upon the skill and patience of the nurse. There must be no attempt at hurry when feeding a patient suffering from chorea, although it will take twice as long as the feeding of any other patient. When there is much difficulty in swallowing, nasal feeding may have to be resorted to. There is, of course, a risk that the catheter, which has to be passed along the floor of the nose backwards and then downwards into the œsophagus, may enter the trachea and the patient be suffocated. It is hardly necessary to say, that should there be any symptoms such as blueness, or difficulty in breathing when attempting to pass the tube, it must be immediately withdrawn, and a fresh start made. The object of the glass tube which connects the catheter with the rubber tubing is that the operator may see whether the fluid is passing freely or not. When the prescribed amount has been given the tube should be compressed with the finger and thumb to prevent air following the last flow of liquid into the stomach. Before commencing the feed, too, the air must be pinched out of the tube or the liquid will refuse to run.

The quantity and quality of the nourishment given will be decided by the physician. It often consists of a pint of milk with one or two well-beaten eggs, and the nurse must be careful not to make the mixture too hot; 95° F. to 100° F. is a safe and comfortable temperature, and if the

jug or glass measure be stood in a bowl of warm water the food will keep at the same heat until the operation is completed. In the most severe cases of chorea nasal feeding may have to be practised with the patient under a general anæsthetic, and chloroform may have to be given to ensure a certain amount of rest and sleep.

With regard to the position of a patient when a nasal feed is to be given, it is generally more convenient to prop him up, but when there are symptoms of heart-trouble the recumbent position must be maintained throughout. All excitement should be carefully avoided, and the bowels must be regularly and freely moved.

Arsenic is frequently ordered in gradually increasing doses, in which case the nurse must be on the alert for symptoms of over-dose. The first signs are puffiness of the eyelids, redness and smarting of the eyes, thirst and dryness of the mouth, with a feeling of constriction in the throat; nausea, vomiting and diarrhœa may follow if the medicine be not stopped in time. Bromides and chloral, either separately or together, may be prescribed to induce sleep, likewise hypodermic injections of morphia. Cod-liver oil is given to supplement nutrition, and a good nurse will never forget that the careful and systematic feeding of a case of chorea is, in familiar phrase, "half the battle." As the patient's condition improves gentle massage of the limbs may be begun, and excellent results are got from combined massage and electrical treatment.

NEURASTHENIA

The treatment of neurasthenia almost invariably takes the form of a rest cure, and the nurse in this case plays a most important part, the success or otherwise of the treatment depending largely upon her tact and good management. The chief points in the "cure" are isolation, complete rest in bed, systematic and excessive feeding, massage and electricity. This combined treatment originated with Dr. Weir-Mitchell, an American physician, and it is usually called by his name. It may be modified or varied by different medical men according to their ideas or the needs of the individual, but the fundamental principles are the same. The nurse will soon learn the importance of complete isolation for these nervous cases, especially as it involves removal from their old surroundings and habits, and from over-anxious and over-careful friends. When rigid seclusion is to be the order of the day, no letters or messages from the outside world may be received, and there is often more difficulty

in carrying out this rule than any other. In bad cases the rest in bed may continue from six weeks to two months or more, and in the beginning the patient must neither wash nor feed herself, nor read nor write. Where there is great exhaustion and low vitality, even reading aloud to the patient may be forbidden.

Systematic and excessive feeding is always reached by degrees, and is adapted to the condition of the individual. A dose of calomel is often ordered as a preliminary purge, and the patient may be kept on a milk diet for twenty-four hours or longer. In cases of much dyspepsia it may be necessary to give skimmed milk, or milk diluted with barley-water, or even peptonised milk, to begin with. It is important that the milk be sipped slowly, and not more than four ounces taken at a time. As the dyspepsia disappears the milk is gradually increased, and a light solid diet introduced, so that by the end of a week or ten days three regular meals and two quarts of milk may be reached, and at the end of four weeks the maximum of three quarts of milk and three full meals per day may be attained. When the patient gets very tired of milk and rebels at the quantity, tea made with boiling milk instead of with water is a welcome change, and half a pint of milk will readily disappear when given in the form of a milk jelly.

All this extra feeding combined with complete rest in bed would probably have disastrous results if it were not for the next item of treatment, viz. massage, which may be begun at the end of two or three days, commencing with only twenty minutes at first, and gradually increasing to a full hour twice a day. Electricity is often given in addition, usually the induced current, but of course both massage and electrical treatment are regulated according to medical directions. Massage must not be given within an hour and a half after a meal, or digestion may be upset. It is better for the nurse and masseuse to be two separate persons, as it is convenient for the former to take her off duty time while the masseuse is in attendance, besides which the entire charge is often too great a strain for one person to undertake.

In commencing a case of general massage when no special order of procedure has been prescribed, it is usual to begin with the feet and legs, passing on to the arms, chest, abdomen, and back. Massage of the spine is very soothing and helpful in inducing sleep. Towards the

end of the rubbing the patient should be given the feed of milk or egg flip which would be due, and when finished be left undisturbed in the massage blanket with blinds down and in absolute quiet for one hour. The sleep which should follow the massage is most valuable, and although it may not be achieved at once, it is one of the first signs of improvement.

There is no doubt that neurasthenics are often most trying and difficult to manage, and it is most important that the nurse should always keep in view the fact that the innumerable fads, fancies, queer tempers and exacting ways of the patient are often really part of the disease. This applies of course to other illnesses than neurasthenia, but there is a special danger in regarding neurotics and neurasthenics as malingerers and impostors. It may be difficult for anyone in full health to understand how the merest trifles can cause exquisite suffering and be brooded over in the most extraordinary way by a person in a weak, nervous condition, but a nurse who has had much experience of these cases knows that even some careless remark, or a small mannerism in someone about the patient, may work upon her to such an extent as materially to hinder her progress towards recovery.

It is never wise to contradict a neurasthenic when she says she has not slept; it is better to accept the statement without remark, even though one knows to the contrary; but if she is haunted by the fear of insomnia, always quietly and cheerfully impress upon her that sleep is bound to come as a result of the treatment she is undergoing, and that even if it tarry no harm will result. The very fact of seeing that no importance is attached to the lack of sleep will often remove the over-anxiety which has driven it away. Doctors as a rule order no sleeping powders or narcotics for neurasthenics undergoing Weir-Mitchell treatment. In many cases the patient has been dosing herself with large quantities of phenacetin, antipyrin or other drugs with the idea of curing sleeplessness or pain, and it may take some time to induce her to believe that she will get well again without such aids.

Never encourage a patient to talk about her ill-health past or present, although it may be to her a very absorbing topic. The nurse who has learnt to discipline herself is the one who will best impart self-control to others, and she who can manage and influence her patients for good without letting them know that they are being led by her, has acquired a very valuable talent.

HYSTERIA

Of all nervous diseases hysteria is probably the least attractive and the most difficult to nurse, and one in which a nurse is most prone to fall into error, being led to think that the patient's condition is entirely due to imagination or a desire to deceive. The most essential point to grasp in dealing with these cases is that the condition results from mental and emotional disorder accompanied by loss of self-control, and that the main element of treatment is moral control. The children of neurotic, ill-balanced parents are those most predisposed to hysterical attacks. Women are much more frequently the subjects of hysteria than men, although the female sex has not an absolute monopoly of this disease. It may occur at almost any age, but is most common in young women between the ages of fifteen and twenty.

Hysteria has been defined as "a state in which ideas control the body, and produce morbid changes in its functions." Its manifestations are manifold, and may simulate almost every form of organic disease. Slight convulsive hysterical attacks, preceded by laughing and crying and accompanied by apparent unconsciousness, illustrate the milder forms of the disorder; hystero-epilepsy, which very closely imitates a true epileptic condition, is a more complicated form of the trouble. Hysterical paralyses are very common, functional paraplegia being the one most frequently met with, and this may be accompanied by an apparent paralysis of the bladder, and loss of voice. A number of spasmodic affections and muscular contractions occur in hysteria, the most extraordinary being those of the diaphragm and abdominal muscles, which may cause what is known as a phantom tumour. This can only be dispersed by putting the patient under a general anæsthetic. Disturbances of the digestive system, perversion of taste and of smell, anæsthesia and hyperæsthesia, dyspnœa, vomiting, diarrhœa, constipation, and other symptoms, may all be met with and persist in the most intractable fashion.

Nursing points.—The general treatment of hysteria is usually directed towards inducing a healthy condition of body and a normal tone of mind, practically ignoring the simulated disease. The Weir-Mitchell system is most valuable for these cases, and is best carried out in a hospital or nursing institution, where the patient is entirely removed from home influences, and where kind but firm and judicious treatment

may be applied without interference from weak and over-sympathetic friends. The principles of the Weir-Mitchell treatment have already been described in the section on the nursing of neurasthenia, and excellent results are often obtained from its employment for hysterical subjects, but it is recognised by medical men that the measure of success depends very largely upon the personality and adaptability of the nurse in charge. The nursing of hysteria certainly makes a large demand upon the qualities of any woman who has undertaken to battle with this insidious foe, and she must be specially intelligent and of a very strong moral fibre if she is to achieve victory.

CHAPTER XXIX

THE NURSING OF SICK CHILDREN

BY E. C. TAWNEY

GENERAL CONSIDERATIONS: Helplessness of the Patient—Nervous Instability—Sensitiveness to Heat and Cold—Attitude, Expression, Cry—Growth, Weight, Dentition—Walking and Talking—Cleanliness in the Nursing of Children—Attention to the Hair—Administration of Food—Administration of Medicines—Respecting Children's Modesty—How to Apply Physical Constraint—Eliciting the Knee-jerks—Syringing the Ears—Syringing or Douching the Nose—Douching the Eyes. Epidemic Gastro-enteritis—Thrush—Ulcerative Stomatitis—Intestinal Worms—Prolapse of the Rectum—Hernia—Intussusception—Broncho-pneumonia—Congenital Malformation of the Heart—Hæmophilia—Urticaria—Eczema—Impetigo Contagiosa—Ringworm—Itch—Night Terrors—Enuresis—Post-diphtheritic Paralysis—Meningitis—Rickets—Tetany—Laryngismus Stridulus—Infantile Scurvy—Diseases of the Hip-joint—Cleft Palate and Hare-lip—Spina Bifida—Imperforate Anus—Phimosis—Enlarged Tonsils and Adenoid Growths.

I.—GENERAL CONSIDERATIONS

Helplessness of the patient.—In considering the nursing of sick children I must lay stress upon the differences which we, as nurses, find between the child and the adult. The first great difference that strikes everyone is the helplessness of the patient. Of course, in some acute and some chronic illnesses the adult is entirely dependent upon others, and we speak then of his being "as helpless as a baby," but in the majority of cases he can at least give expression to his feelings and desires, whereas not only the little infant but even the older child of six or seven years of age cannot or does not give vent to his sufferings in words or afford the nurse any conscious help in discovering his symptoms. This helplessness it is which makes the nursing of children appeal so strongly to some women, while others are repelled by it in an equal degree. The

successful children's nurse must, therefore, be ever on the watch, ready to observe every symptom and note every unspoken want.

Nervous instability.—But one who has hitherto nursed only older patients must not suffer herself to be misled by the fact that a child's nervous system is extremely sensitive and unstable, for signs which would cause great anxiety if observed in an adult are not necessarily of much moment when they occur in a child. This is notably the case with regard to the temperature of the body; indigestion, constipation, excitement, whether pleasurable or the reverse, will cause a child's temperature to rise considerably above the normal. For example, an upward trend of the line on many of the charts will mark "visiting-day" in a children's hospital. On the other hand, a rapid subsidence from pyrexia to sub-normal will cause the patient little or no discomfort.

The same nervous instability shows itself in the acceleration of the breathing and pulse-rate from trifling causes, and in disturbances of the digestive system, the excitement of a prospective outing or party giving rise to vomiting or diarrhoea in many quite healthy children.

On the other hand, the symptoms in some diseases are far less marked than with adults, and in pneumonia or enteric fever, for instance, the nurse may look in vain for what she has learnt to regard as typical signs.

Sensitiveness to heat and cold.—Another point to be remembered is the child's greater sensitiveness to heat and cold. The application of ice needs great watchfulness, as it may result in serious collapse, while fatal burns have been caused by poultices and hot-water bottles, which would have been none too hot for an adult patient.

Having spoken of the need of watchfulness, let us now consider what the nurse has to base her observations upon, taking an infant of under twelve months old as typical of the helplessness of childhood.

There are three points to be specially noticed: (1) the attitude, (2) the expression, (3) the cry.

1. Attitude.—As a rule, a child in health lies on its side when asleep. But when there is any difficulty in breathing, or if seriously ill from any cause, it usually lies on its back, often with the eyes only half closed. Abdominal pain will cause the legs to be drawn up, until the knees almost touch the abdomen. Pain in the head or ears will make the child roll its head from side to side upon the pillow, or it may sit up and clasp its head with both hands. The arching of the back of the head and neck indicates meningitis.

2. **Expression.**—The facial expression is a great indicator of disease. Half-closed eyelids when the child lies asleep betoken a condition of great exhaustion, sunken eyes tell of very acute disease, a contracted brow speaks of severe pain, the twitching of the muscles about the lips and eyes points to great nervous irritability.

3. **Cry.**—The cry of the sick child is most characteristic of its condition and wants, and each variety of cry tells its own tale to the ear of the experienced nurse. To those inexperienced with children, the following sentence from Dr. Goodhart's "Diseases of Children" may be of assistance: "There is the noisy, passionate cry of hunger; the wail of abdominal disease; the whine of exhaustion; the short, sharp shriek of cerebral disease; the hoarse whispering cry of laryngitis."

To these three main points of observation we may perhaps add yet another, though of minor significance, namely the **condition of the muscles** and "flesh" of the child. A very small rise of temperature will make a healthy baby's arms and legs feel soft and "flabby" for the time being, while any exhausting disease will reduce the child wonderfully even in a day or two, and if the thighs are examined, the skin will be found to be in folds and wrinkles upon the inner sides instead of tightly fitting over the firm muscle and fat as in the healthy child.

Deviations from the normal.—Before passing on to the consideration of the nursing of the sick child, let us recall the process of physical development in the normal infant, and note a few of the main points, for deviation from the normal is often a symptom of disease, and a nurse, especially if engaged in private or district work, may often be consulted about a child before the matter has been brought to a doctor's notice, and she should know the approximate ages at which the various stages of teething occur, and the normal weights and heights, so that she can advise as to whether it is necessary to get a medical opinion. She should also know the average rate of pulse and of respiration as compared with that of an adult. To deal with this latter point first, it will be found that the pulse-rate of a young infant is 100—120 per minute, while it will vary from 70—100 in a child of two or three years old, and that the respirations are about 30 and 20 per minute at the same ages respectively. (The nurse will remember that with an adult, the average pulse-rate is about 72, and the respirations 16 per minute.)

Growth.—The average length of a baby at birth is about 19 inches. At the end of six months it should have grown 5 inches, and by the

end of another six months, 3 inches more. During the next two years the increase in height will average about 3 inches annually, and after that about 2 inches annually until puberty.

Weight.—The average weight at birth is 7 lb. At the end of six months this weight should be doubled; at the end of the first year, trebled. After that, the child should gain 4 or 5 lb. yearly, until eight or nine years old, and then increase some 7 or 8 lb. annually, until childhood is past.

Dentition.—A great many ailments are often ascribed to the fact that the child is “cutting its teeth,” and this perfectly natural process of development is held responsible for the results of improper feeding, insufficient ventilation, or injudicious clothing. Very few mothers and not many nurses recognise that the first or temporary teeth are forming in the gum from the third month of gestation (even some of the permanent teeth have begun their development before the child is born), and that the actual eruption is only a later stage of a process which started some twelve months before. Some local discomfort, with perhaps a rise of temperature, may result from the forcing of the tooth through the gum, but bronchitis and diarrhœa are more commonly caused by the alteration of diet which is often made at the same time, or by the onset of that too common disease, rickets.

The age when the “temporary” or “milk” teeth appear differs much in different individuals, even when in perfect health. But all the children of a family usually follow the same order of dentition, whether early or late, and so too it is noticeable that where a baby has one or more teeth in its mouth at birth or at two or three months old, usually another child in the same family, or perhaps one of the parents, has also broken the general rule in the same way.

The *temporary teeth* are 20 in number, consisting of 2 central incisors, 2 lateral incisors, 2 canines, and 4 molars in each jaw. As a general rule, the lower central incisors are the first to appear, usually when the child is six or seven months old. Next come the upper central and upper lateral incisors, then follow the lower laterals and 2 upper and 2 lower front molars. Space between the laterals and molars is left for the 4 canines, which make their appearance at the age of about eighteen months, and some six months later the 4 hinder molars are cut, thus completing the first dentition at the age of two and a half to three years.

The second or *permanent teeth* are 32 in number, and as a rule appear

in the following order : At about six years of age, 4 molars (2 in each jaw) appear behind the existing temporary molars. A year or two later the temporary central incisors drop out and are replaced by the permanent incisors ; the same process takes place with the laterals ; then the temporary molars are replaced by the permanent bicuspid (usually at nine or ten years of age) ; the canines are cut at about twelve years old, and the second molars a twelvemonth later, while the third molars, or "wisdom teeth," may be cut at almost any age over seventeen, or may never erupt at all.

Walking and talking.—Other stages of the child's development are marked by its being able to stand and walk (usually from twelve to eighteen months of age), and by its learning to pronounce sounds and words, then proceeding to arrange the words in sentences. This learning to talk differs very greatly with the individual, but the average age is from eighteen months to two and a half years. The anterior fontanelle usually closes at about this age also, and babyhood may be considered at an end, and childhood commenced.

So much for the development of the normal child ; let us now, before beginning our consideration of the different infantile diseases, note a few points as to the general nursing of sick children with which the nurse should be acquainted.

Cleanliness is, of course, essential in every branch of nursing, but it is not only most important of all in connection with children, but in many instances it is also more difficult to secure. Whatever may be the view about washing an adult patient all over daily, there can be no two opinions as to the advisability of washing a sick child from head to foot every day. The habits of a young child, the tendency to perspire freely, and the liability of the tender skin to chafe, all combine to make this daily bath absolutely necessary. If too ill to be put into a bath, the patient must, of course, be washed in bed, and very carefully dried, especially under the arms and thighs. Thorough drying with a soft towel is far more important than the dusting on of large quantities of powder, which may cake with the moisture from the skin and itself cause irritation. After the completion of the bath, the hair and nails need attention (a fact sometimes forgotten by nurses accustomed to patients who can see to such matters for themselves), and the mouth also should be cleansed. In the case of an infant a piece of lint or boiled rag wrapped round the nurse's finger and dipped in warm boiled water will suffice to

render the mouth and tongue clean and pure. Elder children should have their teeth brushed, or if too ill for this process, some absorbent wool wrapped round a pair of dressing forceps (or better still a round piece of stick that can be burnt subsequently), and dipped in a weak antiseptic such as Condy's fluid should be rubbed lightly round the teeth and sides of the mouth. The liability of children to ulcerative stomatitis renders this precaution doubly necessary in acute disease, especially when liquids alone are being taken, and every nurse should regard sordes on the teeth and lips as a sign of neglect to be avoided as much as bed-sores.

It should be unnecessary to say that a comforter or dummy is wholly inadmissible in a hospital ward, or in a private house, if the parents' consent to its dismissal can be obtained. A very little patience is needed to convince a baby that it can be happy without one, and the evils attendant on the use of such an article are too well known to need recapitulation here.

The passing of the evacuations, of course, needs much attention on the part of the nurse. A child should never be allowed to lie in wet or soiled linen for a minute, and after a stool has been passed into the napkin, the buttocks and adjacent parts should be thoroughly washed with soap and water, and carefully dried before the clean napkin is adjusted.

When a child has had no training in cleanly habits at home, the constant attention needed is often trying to the nurse, and in acute disease it is often impossible to prevent some accidents with the best-trained little ones; but nurses sometimes ignore the fact that a child may have been taught how to behave by its mother, and that it is very foolish and unfair not to carry on its education in this matter. There are nurses who pin up a baby of twelve or eighteen months old in a diaper, and give the child no opportunity of passing its urine and motions otherwise. Every child over six months old should be placed on (or held over) the chamber regularly every two hours, unless too acutely ill.

Attention to this point also obviates the difficulty of procuring specimens of urine from young children for testing. In tiny infants this is a matter that often gives the nurse much trouble. Specimens may be obtained from boys while asleep without much difficulty by attaching a large test-tube to the penis with a strip of strapping; the

tube being surrounded by wool so that it cannot be broken. In the case of girls an arrangement of pillows over a bedpan so that the urine passed will run into the pan will produce the desired result, but this arrangement requires some ingenuity, and a restless child often gives the nurse much trouble.

Let me here turn aside to remark that all abnormalities in urine or stools must of course be at once noted and reported. The normal stool of a healthy infant is semi-liquid, and of a bright yellow colour ; two or even three of such motions are usually passed in the twenty-four hours, until the child begins to take some solid food. Inability to digest food causes the stools to be green, and undigested curd of milk is also often passed. The appearance of blood or mucus would of course be noted, and a look-out kept for worms.

If the child is always kept clean and dry, there is not much fear of bed-sores, as, owing to their light weight, children are not so prone to these bugbears of a nurse as their elders. Places where there is any pressure from bandages or splints must, however, be very carefully watched. Where sores have been contracted before the patient comes under observation, they must be treated on the usual lines.

Attention to the hair.—While on the subject of cleanliness, a few remarks must be made on the need of attention to the children's hair. In hospital work, the majority of the children will be found to have pediculi, or at least nits, in the hair, and it behoves the nurse to be careful that the clean minority do not become infected with these pests while under her care. If a head is in a very bad state, leave to cut the hair close should be obtained from the parents if possible. If the patient is not too ill, the head should then be smothered in a lather of soft soap, which will kill all the lice, after which the nits can be removed by soaking the hair in hot vinegar, which dissolves the cement attaching the nits to the hair, and they can be brushed or combed off. These are homely remedies, but most nurses soon find some favourite treatment to which they pin their faith. The combing of the head with a fine and really *strong* scurf comb must be resorted to daily, or, if necessary, twice a day, and a nurse should aim at having even the worst head free from vermin and nits within a week of its coming under her care.

Administration of food.—Babies under nine months old can usually be fed with a bottle, though sometimes a child accustomed entirely to breast feeding refuses a bottle. A "boat-shaped" bottle will, of course,

be used, and the simpler it is in construction the better. No child should be left alone while sucking its bottle, for it is the nurse's duty to see that it takes its food neither too quickly nor too slowly, that it finishes the prescribed quantity while the food is still warm, and that the baby is not sucking at an empty teat while the milk is at the bottom of the bottle out of reach. While being fed the infant should have its head and shoulders somewhat raised unless for any reason it is ordered to lie quite flat. The ideal position is that in which the child lies when sucking the mother's breast. If there be any difficulty in sucking or breathing, the bottle must be discarded, and the baby be fed with a spoon, or, better still, a medicine measure with a lip; with the latter it is easier to regulate the flow of the milk and pour it into the mouth in tiny quantities, and there is less danger of spilling the fluid, but the nurse must be prepared to use much patience in giving a sick baby its feeds.

Indeed, the administration of liquid nourishment to children generally needs much patience and tact, for milk and beef-tea are not favourite foods, and a combination of coaxing and firmness is often required to get the prescribed amount swallowed. This is not the case where the temperature is high, and the child very thirsty, though even then it is usually water that is craved for, and the prescribed quantity of milk may be taken if a drink of water is promised later on. I hope it is unnecessary to add that such a promise must be faithfully kept; a nurse who does not fulfil her word will soon lose the trust of her small patients, who have tenacious memories and are quick to notice any deception, while ready to confide implicitly in one upon whom they have learnt they can rely. If the drinking of water is not contrary to the doctor's orders, it is usually beneficial to children, including young infants, who often cease crying if given a spoonful of warm water. Drinking water for sick children should always be boiled and kept covered till wanted, and a fresh supply boiled at least once every day.

As soon as a child is allowed solid food, any difficulties about giving nourishment are generally at an end. Bread-and-butter is usually the height of a sick child's ambition, and though milk puddings are sometimes despised by the children of the poorer classes, used to more highly seasoned dainties, the sight of other patients in the same ward enjoying them will soon lead a fastidious child at least to try to eat some. No child should ever be *forced* to take its food, except under medical orders, in which case liquids will have to be given by the nasal or œsophageal

tube. Where it is only a question of overcoming a stubborn will, one passing of the tube will probably convince the patient that taking food in the ordinary way is the pleasanter plan; but when for any reason the process has to be continued, the child soon submits quite willingly to the passing of the tube by the nose, and watches the disappearance of the fluid in the glass funnel with much interest. The passing of a tube by mouth usually excites more resentment.

The mode of administering such feeds has been dealt with elsewhere (Vol. II., p. 179), but emphasis must be laid on the danger of the child catching the end of the tube with its tongue when it is passed down from the nose, and is at the back of the mouth on its way to the œsophagus. Some children are very cunning in doing this, so that before proceeding to pour down the fluid it is needful to look into the mouth and see that the tube is not lying coiled up there. There need be no fear of the tube being in the trachea if a length sufficient to reach below the bronchi has been easily passed down. When giving food to elder children, they must be watched to see that they do not eat it too fast. Children, from poor homes especially, are very apt to bolt their food without masticating it. Sometimes soreness of the mouth or a loose or tender tooth is the cause of this bad habit, and the mouth should be examined to see if such be the case.

The method of feeding by nutrient enemata has been already described (Vol. II., p. 201), and it only need be added that children bear this process worse than adults, and are very apt to return the enemata. The greatest possible care must therefore be taken to administer the enema as slowly as possible. The giving of enemata for aperient purposes also does not differ from the method used for adult patients (Vol. II., p. 199), except that the quantities given will of course be less. A good rule for a soap-and-water enema is to give a quantity equal to two ounces for every year of the child's age, up to ten years old. One pint is usually sufficient for a child over that age. After administering an enema as slowly as possible, pressure with a folded towel upon the anus will assist the child to retain it longer than it otherwise would. When glycerine is ordered, one drachm is usually given. Suppositories, whether of glycerine for aperient, or of meat, etc., for nutritive purposes, are also very useful for children.

Administration of medicines.—The giving of medicines by the mouth does not generally present much difficulty among children in hospital

wards, though the spoilt child often met with in private work is sometimes very difficult to persuade to take the prescribed dose. Tact on the nurse's part must overcome the difficulty, but deceit should never be employed. To say that an unpleasant medicine is nice, or that if this dose be taken no more shall be given, is a course which only results in destroying the child's confidence in its nurse. Nor should a nauseous compound be given in jam, or bread-and-butter, or other food, or the child may take a dislike to the vehicle for ever. Fortunately, many children have no objection to liquorice powder, cod-liver oil, and other compounds, which cause disgust in an adult, and little infants can be given anything which has not a hot or pungent flavour.

When alcohol, such as brandy or whisky, is ordered, it should not be given in a whole feed of milk, etc., but in a small quantity to begin with, then if the patient refuses to finish the last spoonful of the feed, there need not be a contest over it, which with a child too often results in the whole quantity being vomited. The ease with which a young child vomits must not be forgotten, for as the action does not cause the discomfort it does to an adult, simple naughtiness or temper will make a child in some instances bring up its food directly after it is swallowed.

Modesty.—When preparing children for medical examination, care should be taken not to expose them unnecessarily ; quite young children resent being exposed before the doctor's eyes, and as the hospital ward should be a school of morality and modesty, great care should be taken that those patients who already have feelings of decency and modesty should not be given offence, while those who have not should be educated to a higher standard ; but unfortunately both medical men and nurses are sometimes inclined to think that with a child "it does not matter," and bedclothes are turned back and screens left unused in a children's ward, when quite different customs prevail amongst adult patients.

How to apply physical constraint.—To keep children supine in bed is often a difficulty at first, and the best way is to use the old-fashioned arm-straps, which consist of a stout piece of webbing long enough to go across the mattress, and provided with tapes at each end, and another portion which is made of two bands to slip over the arms joined by a cross-wise piece the width of the chest. This latter portion being in place, the long strap is then passed through the arm-bands under the back, and tied to the bedstead at each side. If the child be allowed to lie on its side this long strap can be untied when the patient is asleep, so as to allow

freedom to turn over. After a few days of being fastened down, the child will usually have grown accustomed to lying down, and the straps may be discontinued. In cases in which it is necessary to fasten a child's hands to prevent scratching or rubbing, it is preferable to bandage light splints to the inside of the arm, so as to prevent the bending of the elbow rather than to tie the hands down to the bed, though in a few instances the latter is the only successful plan.

Knee-jerks.—The nurse can be of use to the doctor when he is trying to obtain a child's knee-jerks, by distracting the patient's attention at the critical instant, so that instead of sitting absorbed in the doctor's actions with all his muscles taut, he will look up at the nurse with a word or smile, and the reflex, if present, will be obtained without difficulty.

Syringing the ears.—Children often require to have their ears, noses, and eyes freed from discharge, and the nurse should know the most effective and least painful methods of accomplishing this. Discharge from the ears, a condition known as *otorrhœa*, is usually the result of inflammation of the middle ear during an attack of scarlet fever, measles, or sometimes influenza, and it is very apt to become a chronic condition, and often causes deafness through perforation of the drum of the ear. The discharge, which may be thick and purulent, or thin and watery, has a peculiarly foetid smell, and the ear must be regularly syringed to keep it clean and sweet. An ordinary 2-ounce glass syringe is sometimes used, but as this requires two hands to manipulate, a specially made brass syringe with bone nozzle or an indiarubber ball syringe is generally preferable; the medical man in charge of the case will usually have his own preference in this matter. As a rule, it is well to slip a short piece of drainage tubing over the bone or glass nozzle, but some of the ball syringes are made with a rubber nozzle which needs no further protection. The prescribed lotion, usually boric acid of a temperature of about 95° F., having been drawn into the syringe, the piston must be pushed up, or the ball squeezed, until the lotion appears at the end of the nozzle, showing that all air has been excluded. The nurse should then gently lay hold of the lobe of the ear with her left hand, and draw it away from the head; then, directing the nozzle of the syringe upwards into the orifice of the ear, gently expel the lotion, which will run into the ear and out again into the kidney-shaped tray or small bowl, which an assistant or the patient himself is holding pressed against the neck. After syringing until the lotion returns clear and free from

discharge, turn the patient's head down to the side to let any drops run out of the ear, then dry carefully with absorbent wool. Powders, perhaps boric or iodoform, may be prescribed to be blown into the ear, to be done by means of a proper insufflator, or by placing the powder in a tiny cone of paper, and then blowing it in, which is preferably accomplished by a puff from a dry ball syringe rather than by the nurse's mouth. A piece of dry wool may be loosely packed into the opening of the ear, if the doctor so orders; in some instances he will prefer the ear left open, as the wool keeps the discharge blocked up in the ear. By dint of careful and systematic clearing away of the discharge, the ear usually becomes healthy again, but where this has been neglected at first, the suppuration often extends, and the skull-bones become necrosed, necessitating operation.

The need of great gentleness in the use of the syringe is what the nurse most needs to remember, as if the lotion be too violently forced into the ear, the drum, if then sound, may be broken. When an accumulation of wax has to be removed, greater force has to be used; but this condition is not very common with children, and usually the doctor himself undertakes the syringing of such cases.

Syringing or douching the nose.—The syringing or douching of the nasal cavities is a more objectionable business from the patient's point of view, and often provokes much resistance. It is best, therefore, to begin by wrapping the child up in a blanket, carefully pinned round the neck and chest with stout safety-pins, in such manner that the arms cannot be moved. If the patient is forbidden to sit up, he must lie with his head over the side of the bed, but if sitting up is allowed, the nurse should fix his head firmly under her left armpit, while she holds a bowl below his chin with her left hand. With her right hand she takes the ball syringe, usually 4-ounce size, already filled with warm lotion or salt and water, as prescribed, and gently injects the fluid up one nostril. If the patient will be still and breathe quietly with the mouth open, the lotion will return by the other nostril, but at first, at all events, it is apt to run into the mouth and cause the child to choke and splutter; by bending the head down over the basin, however, it will run out of the mouth. Preferable to syringing is the nasal douche; this may be easily done by fixing a piece of fine drainage tubing on to the end of the barrel of a glass syringe. The latter being filled with the lotion, which is kept at hand in a small jug, the free end of the tubing is

inserted into the nostril and the barrel raised to the level of the crown of the child's head, when the fluid of course spurts up into the nostril. Great gentleness is required in syringing or douching the nose, as too much force might send the discharge or mucus into the passages leading to the ears, and set up septic trouble there.

Douching the eyes.—The treatment of a child's eye is often also vehemently opposed by the patient, so that it is well to secure the arms and the legs as well, by fastening a blanket firmly round the whole body. Most often the eye disease to be treated is of a contagious nature, and the nurse must bear this in mind during all the time of treatment. If one eye only is affected, the other must be protected from the infective discharge, and when the bathing is in process, the soiled lotion must be carefully kept away from the sound organ. All other children must be prevented from coming into actual contact with the patient; towel, bedding, etc., must be kept separate, and every bit of wool or dressing used for the case must be immediately burnt. Nor must the nurse neglect precautions herself, but must do her utmost to prevent any discharge spurting into her own face, and be most scrupulous in disinfecting her hands and nails after attending to the child. To douche the eye effectively the lids must be everted (or turned inside out); this is accomplished by the nurse standing behind the patient, and having bidden him look *down*, taking hold of the edge of the upper lid with the finger and thumb of her right hand, then by laying her left forefinger or a probe or match upon the lid, she can roll it completely over so as to expose the inner lining or conjunctiva. This eversion, though difficult to manage at first, becomes quite easy with a little practice, and can then be done with the right hand only. The lower eyelid needs only to be drawn down. Any discharge upon the conjunctiva having been wiped off with a piece of wool, the lotion is dropped in from another pledget of wool. A syringe should not be used, as any force would injure the eye, and might also cause the lotion to spurt up into the nurse's face. If drops are ordered, it is best to use a proper dropper, being careful that it does not touch the eye, and let the prescribed fluid fall gently on to the eyeball. If it is a strong caustic like nitrate of silver that is ordered, any superfluous fluid or tears running from the eye must be immediately wiped away, or excoriation of the surrounding skin and staining of the linen will result.

Ointments are often ordered to be applied to the eye ; these should be inserted under the lower lid on the end of a probe, then the upper lid being closed, the eye should be very gently massaged in a circular direction so as to send the ointment all over the eye. If there is much pain after any application to the eyes, it may be relieved by bathing the lids with cold water for ten minutes, when the treatment is finished. A little vaseline along the lids will prevent these from sticking together during sleep. In the case of infants and very refractory children, the nurse should sit down and take the patient's head between her knees, his body lying upon the lap of an assistant, who can control his movements while the nurse carries out the treatment, and if an obstinate child closes his eyes and refuses to open them, he will almost invariably do so if he can be persuaded to open his mouth wide, as the former action usually involuntarily follows the latter.

Let us now pass to the consideration of the few diseases which are either peculiar to childhood or the nursing of which differs from that employed in the case of adult patients.

II.—DISORDERS OF THE DIGESTIVE SYSTEM

EPIDEMIC GASTRO-ENTERITIS

This disease, popularly known as "summer diarrhœa," or "infantile cholera," is responsible for much of the mortality amongst children of under twelve months of age, during the warmer months of the year. Of late years much attention has been given to the causes of this disease, and to means of prevention ; it is now believed to be originated by a specific organism which, becoming active at a certain temperature, is conveyed by means of dust and flies to food, and producing toxins after being swallowed, gives rise to great irritation of the stomach and intestine. Milk being a specially good medium for the growth of bacteria, it is the usual vehicle for the conveyance of the disease, and consequently we find it is almost confined to hand-fed infants, though occasionally breast-fed babies contract it, probably from the habit of sucking a comforter, upon which dust or flies may settle.

Symptoms.—The onset of the disease is usually sudden and acute ; the baby is seized with vomiting, accompanied by diarrhœa and colic, and in a very few hours is in a state of collapse. Any food is vomited at once, and the bowels are incessantly being moved. The stools are watery in consistence and green in colour (green particles floating in a colourless

fluid have led to their being described as having a "chopped spinach" appearance), and have a characteristically offensive odour. They are also often so acrid that the buttocks are made red and sore. The body temperature is very variable, sometimes being as high as 105° , but in other cases being sub-normal. The appearance of the child is one of absolute prostration, and a previously healthy baby lies in a moribund condition within twenty-four hours of the first attack. The extremities are cold, the pulse and respiration feeble, the face thin, grey and pinched, the eyes sunk and staring; the abdomen is retracted, and the skin lies in loose folds and wrinkles, while the cry is but a little feeble whine. In a fatal case convulsions may ensue, or the child passes into a state of coma. The illness often terminates fatally within two or three days, and in the event of recovery the patient's digestive system is usually left in an enfeebled state for months to come.

Nursing points.—When a child suffering from this disease is brought into hospital or first seen in its own home, the state of collapse usually calls for immediate attention. The baby must be wrapped in a warm blanket with hot-water bottles beside it, or laid on a pillow filled with hot water (care being taken to avoid all danger of burning the skin), or the child may be immersed in a hot bath, and then wrapped in the blanket. In cases in which diarrhœa exists without vomiting, a dose of castor oil to remove the cause of irritation is often prescribed, or irrigation of the bowel may be preferred. In some instances, washing out of the stomach is also ordered, but such measures must not be employed without medical advice, as they may prove dangerous where there is much collapse. Enemata of salt and water to be retained are sometimes also given, as they help to supply fluid to the tissues, which have been drained by the incessant diarrhœa.

As regards the giving of food, plain boiled water to relieve the thirst is alone suitable while the vomiting continues, and this is of use in helping to wash out the stomach even if it be brought up again immediately. Albumen water (the white of one egg beaten up in half a pint of cold boiled water, with a pinch of salt added) is given next in very small quantities at a time. Veal broth is preferred to the albumen water by some doctors, but in any case, milk must not be given, as it may not only convey the poison afresh, but would be a medium for the further growth of the organisms in the stomach. Brandy is usually ordered. The condition of the stools is the great criterion of the

progress of the illness; when they begin to assume a normal colour and consistency, there are hopes for the child, but the greatest care is still necessary with regard to the diet, as the digestion is left in a much enfeebled state, and a return to milk must be made very gradually.

The contagious nature of the disease must always be borne in mind by the nurse, and she must take care to wash and disinfect her hands after changing the baby's napkin, or she may reinfect the patient's food, or convey the disease to others. Where there is a ward in a hospital specially devoted to the nursing of infantile diarrhoea, it is usually the rule to have one set of nurses to *feed* the patients, while others attend to the evacuations, changing of linen, etc. All soiled linen should also be put at once into disinfectants and subsequently boiled.

As this disease is largely preventible, it behoves all nurses and other workers among the poorer classes to instruct mothers in the precautions which should be taken in the summer months to avoid it. No breast-fed infant should be weaned at that time of year; "comforters" should not be allowed; flies about the house should be destroyed as far as possible, and if there are many the baby's face as it lies asleep should be protected from them. For bottle-fed infants, great attention must be paid to the milk, which should be boiled for two or three minutes immediately upon delivery, and then placed in a *covered* vessel in as cool a place as possible. Tube bottles should on no account be used, as it is impossible to clean the long rubber tubes satisfactorily, and the boat-bottles must be rinsed directly after use, washed thoroughly with soda water, the teat being turned inside out and scrubbed, and each bottle should be *boiled* at least once daily. Some medical men advise the discontinuance of cow's milk at this time, and the substitution of condensed milk, or some patent food which is made without the addition of milk. A desiccated milk powder has also been suggested for use, but unless proper care is taken in protecting the condensed milk or other food from contamination by dust and flies, these substitutes convey the disease as effectually as cow's milk, and in any event, a return to milk is to be recommended as soon as the danger of the disease is over. Older children are also liable to contract this form of enteritis, but they have it less severely, and deaths from this cause after the age of twelve months are not common.

THRUSH

This is the popular name for a parasitic stomatitis, to which the youngest infants are liable. Unfortunately, common opinion holds that the complaint is not only inevitable, but that serious consequences would follow if "the thrush did not pass through the child," so that a mild attack is held to be more alarming than a severe one, and measures of prevention are considered to be not only useless, but even dangerous. This is, of course, mere superstition, to be combated by all who know better, for thrush is quite preventible if simple measures of cleanliness be employed, and the appearance of it should be held to betoken carelessness on the part of the nurse or the mother. Wiping out the infant's mouth with a clean piece of rag or wool dipped in clean boiled water or weak boracic lotion two or three times a day forms a perfect *preventive* measure.

Symptoms.—When the disease is present, tiny white specks may be seen upon the tongue, gums, roof and sides of the mouth, and these specks increase in size and run together until larger patches are formed. The child now has pain whenever it attempts to suck, and usually its digestive functions are upset, and the motions are loose and green. Where the baby is breast-fed, the mother's nipples usually become sore. Owing to the acrid nature of the stools, the skin about the anus and buttocks often becomes red and excoriated, and the mother announces that "the thrush has passed through the child."

Nursing points.—Greater care than ever must be paid to the cleanliness of the child's bottle and teat, also to its "comforter," if it has one. If the baby is breast-fed, the mother's nipples must be washed after each nursing. Each time the child has finished its meal, its mouth must be wiped out with clean rag (a fresh piece each time), dipped in boracic lotion, or in borax and honey or boroglyceride, and again wiped out with water or lotion before the next feed. In this way the disease is soon improved locally, and the gastric symptoms disappear also.

ULCERATIVE STOMATITIS

This disease is somewhat similar to thrush, but it is met with in older children, usually before the cutting of the second set of teeth. It often occurs after an acute febrile disease, like measles, and also prevails among children living together in large numbers under poor hygienic conditions.

Symptoms.—After some slight feverish symptoms the child is noticed to have some difficulty in eating, or perhaps to decline its food altogether, and when the mouth is examined, it is found that there are ulcers along the edge of the gums and upon the inside of the cheeks. These ulcers may form quite large patches, which appear to have eaten deeply into the mucous membrane, and which have inflamed swollen edges, that bleed upon the slightest pressure. Saliva and blood run from the mouth, the breath has a peculiarly foul odour, and sometimes the outside of the cheek is considerably swollen. In the majority of cases, the disease is confined to one side of the mouth, but it sometimes affects both sides simultaneously.

Nursing points.—Internal treatment, usually a combination of chlorate of potash and iron, will probably be ordered by the medical man, and in some instances the application of phenol (or pure carbolic acid) is made to the ulcers, but this is usually done by the doctor himself. To the nurse it falls to treat the mouth by syringing or swabbing with the prescribed lotion, generally boracic acid, or permanganate of potash, or peroxide of hydrogen, according to the preference of the doctor, and the speed at which a cure is effected greatly depends upon the diligence and conscientiousness with which this is carried out. Unless other orders are given, it is advisable to clean out the mouth before each meal and the last thing at night. Liquid and soft foods must, of course, be given until eating is no longer painful.

INTESTINAL WORMS

Various kinds of worms are found in the intestines of children; thread worms, round worms, and tape worms being the names by which they are usually known.

Symptoms.—Popular opinion ascribes to the presence of these worms a large number of symptoms, many of which are more often due to other causes; but a large appetite combined with an ill-nourished appearance, restlessness at night, and a tendency to scratch the buttocks and round the anus are fairly dependable signs, as is also the appearance of vaginal discharge in girls. All doubt is, however, removed when, after the administration of an aperient, worms or portions of a worm are found in the evacuations.

The nurse should study the appearance of the various worms so as to be able to distinguish them. *Round* worms are easily seen, and resemble

an ordinary earthworm in appearance. As a rule only one or two are passed, or they may be vomited, having made their way into the stomach. *Thread* worms (the most common of these parasites) look like little threads of white cotton, and are often passed in large numbers at a time. In order to discover them, the fæces must be put into water and then broken up with a piece of stick and carefully examined. This requires minute observation, especially when a patient has been under treatment for some time, and it is important to know whether any worms are still being passed or not. *Tape* worms look somewhat like a piece of crimped tape. They have a tiny pin-point head, which attaches itself to the intestinal wall, and unfortunately long segments of the worm often come away *without* the head, which means that the worm still exists, and will form new segments, and therefore until the head is ejected the patient cannot be considered free from the trouble. It is the head, therefore, for which the stools must be most carefully searched. These worms may reach several feet in length, but fortunately are less common than those previously mentioned.

Nursing points.—Treatment usually consists in the giving of a vermifuge by mouth (usually *santonin* for round worms and extract of male fern for tape worms) before breakfast ; a dose of castor oil having been administered the previous night. The bowel having been cleared of fæcal matter by the oil, the worms are left exposed to the action of the drug, and after a second dose of oil about midday, they should be expelled. Thread worms are often treated by *enemata*. A soap and water enema is given to clear the bowel, and then followed by one of salt and water half an hour later ; one drachm of common salt dissolved in half a pint of warm water being the usual quantity injected. There is always a danger of the child reinfecting itself by scratching the anus and then carrying the eggs of the parasite on its nails to its mouth ; it is therefore advisable so to fasten the hands that the child cannot scratch itself. The itching round the anus is usually treated by an appropriate ointment, and the parts should be well washed with soap and water after every action of the bowels.

Thread worms sometimes creep into the vagina and set up irritation there, causing a troublesome discharge. Treatment usually consists in placing the patient in a medicated bath, or in giving vaginal injections, but the main point, of course, is the removal of the worms from the intestine by the means already mentioned.

PROLAPSE OF THE RECTUM

This is a by no means uncommon trouble in weakly children, especially those who suffer from constipation and are in the habit of straining in order to procure an action of the bowels.

Symptoms.—After passing a motion, a red mass is seen to project from the anus, which upon examination proves to be the lowest portion of the bowel. If noticed at once, there is not usually any difficulty in returning the extended portion, but if some hours have elapsed since the occurrence of the prolapse, it will be much less easy, and fatal results have ensued from a prolapsed bowel not being replaced for several days.

Nursing points.—Before attempting to return the obtruded bowel, which may be two or three inches in length, the nurse should sponge it gently over with a little warm water, then, after slightly oiling the surface, pressure upon the central portion with a pad of lint should be made, and the prolapse will probably at once disappear. In cases where the bowel “comes down,” to use the popular phrase, at every action, the child should be made to pass its motions lying down, or if seated, the buttocks must be kept close together by means of placing two wide strips of strapping one before and one behind the anus. Measures must be taken to secure that the bowels act regularly, preferably by means of some change of diet, and the doctor will probably order a tonic to improve the general health of the child.

HERNIA, OR RUPTURE

The protrusion of the bowel through the abdominal wall at the place where the navel has only just healed, is known as an umbilical hernia, and is fairly common amongst little infants. If reduced at once and kept in place, a cure is easily affected. Inguinal hernia is rather less common, and is more difficult to cure, but here, too, the seeking of medical advice and the procuring of suitable treatment makes the prognosis much more favourable.

Symptoms.—The appearance of a small lump, which alters in size as the infant moves or cries, at the navel, points to umbilical hernia. A lump in the groin, which “comes down” at intervals, is the sign of inguinal hernia.

Nursing points.—The mother needs instructing in the fact that the

hernia must be not only "put back," but kept in position *always*, in order that the opening in the wall may have time to close and to grow firm. A pad is applied to an umbilical hernia after the loop of intestine has been returned; a penny sewn up in flannel or a piece of cork of the same size forms a convenient home-made instrument. This being placed over the umbilicus, a piece of strapping some three inches deep by six wide is warmed and made to adhere to the skin and keep the pad in place, and another strip of strapping half an inch larger each way is applied over the first. A few turns of bandage, to prevent the strapping being rubbed completes the truss. An indiarubber belt is also supplied by instrument makers for the same purpose. To attempt to keep the hernia in position by means of a tight binder is not advisable, as the binder must press uncomfortably if not dangerously upon the abdominal organs, if this object is really attained. Pressure must, of course, be *always* kept up, as crying or kicking will otherwise cause the hernia to return, and the effect of previous treatment be nullified.

Inguinal hernia usually involves the wearing of a properly fitted truss, and on no account should a mother be allowed to think that an old truss discarded by another child will serve the purpose. Sometimes, for very young infants, the doctor will order a wool truss, and the mother must be shown how to apply it. A skein of white fingering is put round the baby's waist, and one end slipped through the loop of the other end, and then looped through again, so as to form a firm knot. This knot is then placed over the hernia, which has been previously reduced, and the loose end carried down under the thigh and up to the belt of wool behind, where it is secured. Two of these trusses must always be procured, as they need removing every time when wet or soiled, and the other must be worn while the first is being washed. All trusses need to be kept very clean and the skin scrupulously watched for any signs of pressure or chafing. A plentiful use of soap and water, careful drying, and the dusting on of a little powder are the best means of preventing chafing. The child's mother needs warning as to the danger of an irreducible hernia, and the necessity of obtaining medical aid *at once* if she cannot get the rupture back herself, as an operation will probably be necessary.

An operation for hernia is carried out on the lines of other abdominal operations, and the after-nursing of the case is, of course, also similar. In the case of very young children the greatest pains must be taken to

keep the dressing dry and clean. A piece of jaconette should cover the whole dressing, with a hole cut in it for the penis, to which it is usually advisable to attach a large test-tube or specimen glass, for the urine to run into, when the patient is only an infant.

INTUSSUSCEPTION

This name is applied to the condition in which one portion of the bowel becomes drawn inside an adjacent part of the intestine. It is not a very uncommon occurrence amongst infants and young children, and often has fatal results, as it usually causes strangulation of the bowel.

Symptoms.—A previously healthy child suddenly begins to vomit; the bowels fail to act, though some blood-stained mucus may be passed, the legs are drawn up, and there is a frequent sharp cry of pain, while the face looks pale and drawn, and there are dark rings under the sunken eyes.

Nursing points.—The application of heat, by means of a fomentation or poultice, to the abdomen may be ordered to relieve the pain. The child must be watched, and any passing of fæces or flatus immediately reported, as this would mean an improvement in the prognosis. Opiates may be ordered to prevent any peristaltic action of the bowels, and efforts will probably be made to reduce the intussusception by manipulation through the abdomen. Failing in this, air or water may be forced into the bowel by the rectum, so as to cause distension of the intestine, and if all these methods prove unsuccessful, laparotomy will probably be performed. This operation will not differ from that undertaken for other conditions, and the after-nursing will be the same, but as these very young patients are very prone to fatal collapse after abdominal operations, the preservation of the body heat, by means of stockings, hot bottles, and warmed blankets, must be most carefully maintained, and all unnecessary exposure of the skin be most anxiously avoided. Even with the utmost care, only a minority of these cases recover.

III.—DISEASES OF THE RESPIRATORY AND CIRCULATORY SYSTEMS

For the most part, children suffering from these diseases will be nursed on the same lines as adults, and reference should be made to the chapters devoted to them elsewhere, but there are some complaints more especially affecting children which must be noticed here.

BRONCHO-PNEUMONIA

This disease is very common amongst children, who suffer from it far more often than from either pure bronchitis or pure pneumonia. Those under the age of four years are the most frequent victims, and it often follows upon an attack of measles or whooping-cough, while it is specially fatal to children who are suffering from rickets. The mortality amongst young children who fall ill with this disease is estimated at 20 per cent.

Symptoms.—The child has a temperature of 102° or more, but looks pale and livid rather than flushed; the respirations are quick, perhaps 100 to the minute, shallow and very laboured; the nostrils dilate with every breath, and there is an incessant hard, dry cough.

Nursing points.—All draughts must be avoided, and the temperature of the room should be kept at 60° to 65° , but there must be plenty of fresh air admitted. A screen round the head of the bed is often the best way of preventing draughts. As moisture in the air makes the breathing easier, a bronchitis kettle is often used for these cases. Many medical men prefer this to be so placed that the child obtains the benefit of the steam without having the bed enclosed by a tent, which is sometimes considered antagonistic to thorough ventilation. Others will order a tent. In any case the nurse must be very careful so to place the kettle that the child cannot touch it, nor come into close contact with the stream of steam, or a serious burn or scald may be the result. Poultices, though generally out of favour in the present day, and certainly harmful in inexperienced hands, are sometimes ordered for these cases. Mustard and linseed are usually prescribed, and for children should be made in the proportions of one to five, and be quite thin and light. Mustard plasters, one part of mustard to four of flour, spread on brown paper, are perhaps more favoured than poultices, and are better for children than mustard leaves. Turpentine stupes are another resource; to sprinkle an ounce of turpentine on to the surface of the boiling water after the stupe has been immersed is a good way of preparing these, but some doctors order the stupe to be wrung out of pure turpentine. In this case a thin coat of vaseline must be laid all over the skin that the stupe will touch before it is applied, and the application must be most carefully watched. Either plasters or stupes are, of course, only to be applied until the skin is well reddened. Upon their removal, the skin should be wiped over and a little powder dusted on to ease the stinging, and, with the doctor's approval, a wool-

jacket may then be put on. This is made by laying non-absorbent or grey wool between two layers of butter-muslin and quilting it all together. It should be shaped to fit the child, and fastened by tapes on the shoulder and down one side. A new jacket will be required at least once a week.

Sometimes, instead of poultices or stupes, the application of cold will be ordered, and ice-bags or cold bathing will be the means employed; but children are rather prone to collapse under these measures, and the nurse must be very watchful of the pulse during the treatment. The inhalation of oxygen is also sometimes resorted to, when there is much cyanosis and dyspnœa, but is not usually of much avail. In mild cases rubbing of the chest with some liniment, as turpentine or camphor, may be prescribed. In doing this, the nurse should rub both back and front of the chest and well under the arms, until the skin is red and glowing, and a pad of wool or the wool-jacket should be put on directly the rubbing is finished.

There is no crisis in broncho-pneumonia, but the temperature gradually subsides in cases that progress favourably, the attack lasting three or four weeks, though it may be long before the child regains its normal health. Fluid diet will, of course, be given, and stimulants may be prescribed.

CONGENITAL MALFORMATION OF THE HEART

Nursing points.—Of the varieties and causes of these cardiac deformities we need not speak here, but there are two points which a nurse should remember, if she has anything to do with one of these unfortunate little beings, who will probably not reach adult life.

One is their great liability to incur bronchitis and pneumonia, so that every care must be taken not to allow them to be chilled by undue exposure. This does not, of course, mean that they are not to have all the fresh air possible, for a good supply of oxygen is specially important for them, but that they are to be warmly and lightly clothed, especially as to the extremities, and to be protected from damp, east wind, etc.

The other point to note is that as such children are very apt to have attacks of breathlessness and cyanosis if in any way upset, they are usually humoured in every possible way, and the nurse finds herself confronted with the difficulty that if her patient's whims are thwarted in any way, if he is required to take his medicine or do anything he does not wish, he will probably have a cardiac attack, and becomes alarmingly

cyanosed, his lips, ears, fingers, perhaps the whole face, being of a deep purple colour, while the action of heart and lungs seems paralysed. The greatest tact and management are therefore required in the case of such a patient, whose caprices must not be unduly humoured, although, on the other hand, his feelings must not be roused to antagonism.

HÆMOPHILIA

The unhappy victims of this disease are commonly known as "bleeders." Owing to some cause not yet fully understood, the slightest injury gives rise to an escape of blood either internally or externally, and cases have occurred where there has been fatal hæmorrhage after some superficial cut, or the extraction of a tooth. This disease is hereditary, and is far more common amongst boys than amongst girls, but a woman who belongs to a hæmophilic family may transmit the condition to her sons, though she shows no symptoms of it herself.

Symptoms.—The symptoms are the appearance of bruising; that is to say, the escape of blood from the tiny vessels under the skin upon the slightest pressure. To lay a hand upon the arm of a hæmophilic subject will produce a bruise, and from any tiny cut or scratch there will be almost uncontrollable oozing of blood.

Nursing points.—The cases which will most probably come under a nurse's care are those in which there has been an escape of blood into some large joint, most frequently the knee. The treatment will be the same as is employed for the escape of any fluid into a joint, namely, rest, perhaps upon a splint, with probably the application of ice to the part. What the nurse needs specially to remember is the liability of dangerous hæmorrhage from trivial causes. The child must not be given any toy which could possibly inflict a cut or scratch; great care must be taken when its nails are cut, and all pressure must be avoided. A look-out must also be kept for the passing of blood from mouth, nose, or anus; and if this should take place the doctor must, of course, be immediately informed.

IV.—DISEASES OF THE SKIN

URTICARIA, OR NETTLE-RASH

This disorder, though it manifests itself upon the skin, is usually symptomatic of some disturbance of the nervous or digestive systems. Amongst children, it may be caused by the presence of worms in the intestine, but more often it arises from eating such indigestible matters

as rich cake, mince-pies, or unlimited sweets, while fish or stewed rhubarb will always cause this rash to appear in certain individuals. The injection of the diphtheritic antitoxin serum also often gives rise to urticaria.

Symptoms.—Red patches accompanied by violent irritation appear on the skin, and as the patient rubs and scratches the inflamed part, the large white wheals arise, which, from their similarity to the eruption caused by the poison secreted in the leaves of the common nettle, originated the popular name of nettle-rash. These patches may disappear as suddenly as they came, while others crop up on another part of the skin, so that a patient who had his trunk covered with the rash one time may have that portion of his body quite free half an hour later, while patches of the eruption exist only on his arms.

Nursing points.—The removal of the cause is, of course, the matter for immediate attention, and a dose of castor-oil or liquorice powder is given at once. The allaying of the local irritation is the next question, and this may be done by gently rubbing the part with olive oil, or a lotion made of glycerine and water, and a little bicarbonate of soda. Gentle friction usually relieves the irritation, although scratching only tends to increase it.

ECZEMA

This is a much-abused name, various diseases of the skin, including ringworm, being often so called. True eczema amongst children is most often seen in infants of less than a year old, and is an inflammatory condition of the skin, which always causes great irritation. Contrary to popular opinion, there is no evidence that eczema is contagious, nor is it actually hereditary, though the condition of the skin which inclines to the incidence of the disease may be handed on from parent to child.

Symptoms.—The appearance of the disease differs according to whether the eczema is “dry” or “weeping” (to use the popular terms); if “dry” the skin in certain parts is red, rough and scaly, while the “weeping” variety has the skin over the eruption broken, and discharge oozes out from it, and then dries on the surface, forming thick crusts. In either form the disease is most commonly seen on the scalp and face, and behind the ears, and also—generally here the dry variety—in the folds of skin about the back of the neck, the axillæ, and groins, and on the buttocks. It may be caused by the chafing of some garment, by vermin, and want

of washing or properly drying the skin, or in infants by their being allowed to remain for long periods with wet napkins.

Nursing points.—If any such cause as those mentioned is found to exist, it must, of course, be at once removed. To cure the existing condition in the discharging eczema, all the crusts must be cleared away before any treatment can be successful. If the disease affects the scalp, any hair must be cut quite close to the head, then the crusts must be softened by the application of a thin linseed poultice, or rags soaked in olive oil, bandaged firmly to the head for some hours. Once the caked discharge is made soft, it can be removed with forceps. Ointment is usually ordered to be now applied spread on strips of lint or rag (the latter is better as being less hot); if the face has to be treated, a mask of butter muslin must cover the whole, with holes cut for eyes, nose and mouth. The dry form has no crusts to remove, but is otherwise treated in the same way, or lotions may be ordered to be applied on rags, and oil-silk laid over all, as the rags must always be kept moist, if the lotion treatment is to be effective. Where the eczema exists in the groins, etc., powder of some sort is often ordered, and the parts have to be kept absolutely dry; where there are two folds of skin in apposition, as under the thigh, a slip of lint or butter muslin or plain gauze prevents any friction between the parts. Cases of eczema are not allowed to be much washed, soap is usually quite forbidden, and an occasional bath with oatmeal and water is all the ablutions allowed. Rubbing the skin all over with a dusting powder will keep it clean between the baths. All scratching must be prevented; the splints down the arms, previously mentioned, will help to accomplish this, but with little children it is often well also to tie their hands up in a clean pair of socks, or to muffle them with wool and bandage, for the irritation of the skin in eczema is very great.

IMPETIGO CONTAGIOSA

This disease is generally seen in dirty and neglected children, and will often come to the notice of the district nurse. Its contagiousness is very obvious, for the sufferer usually infects himself from the original sore, so that pustules are found on face, hands, and all over the body, while in a family more than one child usually has it. When it affects the scalp, pediculi or nits are almost always also present.

Symptoms.—One or more pustules, sometimes mistaken for chicken-

pox, first appear, and these become large sores, owing to the child scratching and picking them, until sometimes a large confluent sore extends all over the head or all round the mouth and chin. If not treated, the dirt conveyed by the child's nails sets up septic poisoning, and the neighbouring lymphatic glands, at the back of the neck or below the chin, swell and may suppurate.

Nursing points.—All vermin and nits must, of course, be removed and the hair cut as close as possible to the head if the impetigo is on the scalp. The scabs on the sores must be cleaned off by bathing or soaking with olive oil; after which the prescribed ointment, often a mercurial preparation, is rubbed in, and the disease is soon cured, unless further infection occurs. To attempt to treat the sores without first removing the scabs is quite useless.

TINEA, OR RINGWORM

During the last two decades this disease has become far more prevalent than before, and may now be regarded as the bugbear of educational authorities, as it prevents children from attending school for months or even years together. So far its ravages are mostly confined to the metropolitan area and the southern counties of England, and it is not so common elsewhere. Though a parasitic disease, it is not caused by an animal but by a vegetable parasite, a species of fungus or mould, which on the scalp penetrates to the very root of the hair. If a diseased hair be drawn out of its follicle, and, after proper preparation, examined under the microscope, the spores of the fungus will be seen both outside and inside the hair. Ringworm also affects the skin, apart from the scalp, and adults are liable to have it in this way, but it is very rare for anyone over the age of sixteen to have it in the hair. There are many varieties of ringworm, affecting human beings and also different animals, but two only are common amongst children, and as the symptoms and treatment of both are very similar, it is unnecessary to differentiate between them here. This is not a "dirt disease," and is more often seen among children in clean homes than in very dirty ones, while the mothers who wash the children's heads very often are more liable unwittingly to spread the disease all over the scalp than those who care less for cleanliness.

Symptoms.—Where the disease is on the body, but not on the scalp, it will show itself as a red ring slightly raised above the surface of the

epidermis, or perhaps as a tiny red spot, which, if untreated, will spread outwards into a ring. In some cases these rings grow to a considerable size, and occasionally a network of rings may be seen on the trunk. On the scalp a slight redness may be the first sign, but as a rule nothing is noticed till a scaly, scurfy patch, on which are a few broken hairs, attracts attention. Sometimes the falling out of the hair, resulting in the presence of bald patches, arouses suspicion, but too often the disease is unrecognised until there are numerous or very large patches. The appearance of short hairs, twisted or bent or merely thin and fluffy, betokens the disease, and until not one of such "stumps" or "degenerate" hairs can be found on carefully searching the scalp, the patient cannot be declared free from it.

After a little experience, a nurse can soon learn to detect the suspicious hairs, and a bacteriological examination of these will settle the question. Any nurse engaged in district or school work will find the knowledge very essential. It should be remembered that quite *clean, bald* patches on a child's head may be due to alopecia areata, not ringworm.

Nursing points.—The choice of drugs, whether lotions, paints, or ointments, lies, of course, in the doctor's hands, and every case of ringworm needs medical attention from first to last, but it is upon the diligence with which the treatment is carried out that the ultimate curing of the affection depends.

The patches on the skin can be got rid of in two or three weeks by applying the ordered remedies every day, but those on the scalp, when the fungus has entered the hair follicles, may exist for months, and even years, even when treated. The first thing is to have the hair cut to within a quarter of an inch of the scalp over all the infected areas, and if possible, all over the head, so that a careful watch can be kept for the appearance of fresh patches. It is useless to attempt treatment while the hair is long. Every infected child must, of course, have its own towel, brush, etc., kept apart from all others, and a linen cap fitting close to the head should be worn day and night. By this means the patient is not only less likely to infect others, but also does not infect fresh places on its own head by turning on the pillow at night, or shifting its hat about in the daytime. Such caps can be washed every other day, duplicates being worn, and they should be kept on under the hat out of doors. As a rule, the application ordered is intended to cause some

local inflammation, which loosens the hairs and enables them to be removed from the head by rubbing and by depilating with forceps, an ointment being subsequently rubbed well into the skin so as to disinfect the follicles; watch must then be kept for the appearance of the new hairs, and the progress of the cure is estimated according to their being normal hairs of good texture and colour and lying in the line of the other hair, or hairs with hooked or twisted ends, broken off and standing upright. Any appearance of scurf too upon the scalp, even when the disease is supposed to be eradicated, is very suspicious, and often if the scurf is raised with the forceps, typical stumps will be found sticking to it.

During the last few years treatment by means of the X-rays has been most successfully employed for cases of ringworm of the scalp. The effect of the rays is to cause the hair, whether diseased or not, to fall out, by which means the disease is quite eradicated, but as the rays do not destroy the fungus, the falling hair is still contagious, and care must be taken that it has no opportunity of infecting other heads. The application of the rays will, of course, be in the hands of the electrician, but the nurse will be responsible for the case subsequently, and must see to it that the hair when it does fall out, fifteen to twenty-one days after the application of the rays, is burnt, and also that all stumps are removed from the skin. This is often a tedious business, for they may be too short to pick out even with fine forceps, and it is only by diligent massage that they can be worked out. It is from two to three months before the new hair appears after the X-ray treatment, but with every diseased hair gone, the child can be declared free from infection and allowed to return to school.

Whatever treatment is used the cure of ringworm is a tedious affair, but one in which perseverance and diligence are certainly rewarded. Too often the patient's parents become disheartened by the slow progress of the cure, and drop the prescribed treatment for one of the manifold remedies suggested by their neighbours, trying ink, vinegar in which a penny or horse-shoe has been steeped, tobacco and lard, etc., in turn. It is for the out-patients' or district nurse to combat these suggestions, and to encourage adherence to the doctor's treatment, and while reproving the mother who does not carry out her orders, not forget to praise her who diligently rubs in the ointment for "five minutes by the clock."

SCABIES, OR ITCH

This may fairly be called a "dirt disease," for it is found amongst those who make little effort after personal cleanliness, and is caused by an animal parasite, the *Acarus scabiei*, a tiny roundish creature, which when full grown is just visible to the naked eye. The female acarus makes burrows under the skin, at the end of which she lays her eggs and then dies, leaving the eggs to hatch out at the end of a fortnight, when they emerge from the burrow and carry on the disease. Itch is very contagious, the parasite being easily transferred from one person to another, especially when they sleep together.

Symptoms.—The skin between the fingers and toes is usually the first to be attacked. Upon close examination, tiny white pimples and wheals will be seen, but the itching is so great that frequently the affected parts display only scratches and sores. If the condition remains untreated it will spread up the limbs and all over the body, the face and scalp alone escaping.

Nursing points.—The killing of the parasite is, of course, the object to be attained, and for this sulphur is regarded as a specific. Sulphur baths, or inunction of sulphur ointment, or bathing with water and Brooke's soap, and then rubbing in flowers of sulphur, are the means usually employed. The sheets should also be sprinkled with flowers of sulphur, and clean underlinen put on every day, the discarded linen being boiled, and all unwashable garments baked. The sulphur treatment is usually ordered for a week, as a too prolonged use of it may cause a pustular inflammation of the skin, and some other ointment may then be prescribed, or the sulphur continued just in those places where the scabies still exists. The disease is generally cured in two or three weeks if the instructions are attended to.

V.—DISEASES OF THE NERVOUS SYSTEM

Owing to the instability of the child's nervous system which has been already noted, childhood is the age at which various nervous disorders appear. Infantile paralysis, convulsions, and chorea have been already dealt with,* and I may therefore begin with

NIGHT TERRORS

The night terrors of children are perhaps more the manifestation of nervous disorders than a disease, but they are sufficiently alarming to anyone unused to little ones to deserve mention here. Children

* See pp. 190, 196, 199.

suffering from adenoid growths, from rickets, or from infantile paralysis seem to be peculiarly liable to this trouble.

Symptoms.—As a rule the child has been asleep for two or three hours, when it suddenly starts up in bed and begins to scream. The eyes may be wide open, and tears streaming from them, but the mind is not yet awake, and the first aim is to rouse the child thoroughly from its sleep.

Nursing points.—If possible the nurse should take the child out of bed and, holding it on her knee, assure it of safety. The screams will soon cease, though the child may continue to tremble as it clutches its protector with both hands, and the sobs may still be uncontrollable. A drink of milk or of water will help in the soothing process, and as soon as possible the child should be tucked up in bed again, when, reassured by the nurse's presence, it will probably fall asleep, and will perhaps wake in the morning quite oblivious of the whole episode. The removal of the adenoids, if present, or the improvement of the general health, will probably cause the nervous manifestations to cease.

Some children are seized with similar panics in the daytime while awake, and, leaving their toys, will fly to mother or nurse in sudden terror of something unknown and indescribable, but such diurnal terrors are less common than nocturnal frights.

ENURESIS

The passing of urine in the bed at night is often also a symptom of nerve weakness, though, of course, amongst hospital patients it may be due to lack of proper training at home. Incontinence of urine by day betokens more serious evil, as a rule.

Nursing points.—In all cases punishment should be avoided. Careful attention to wants which are not expressed, and due reward of improvement in habits are the most hopeful methods of treatment of cases that are due to defective training, while where there is true incontinence (whether by night or by day) constant attention and due observance of the doctor's orders as regards medicine and diet are the only possible lines of treatment. To restrict the amount of liquid taken during the last few hours before going to bed is reasonable, and to avoid all drinking of *tea* as a beverage is also a good plan, but it is cruel to keep the child short of fluid all day, and is useless also. All harshness must be care-

fully avoided, for many of the sufferers from this trouble feel the shame of their condition acutely, while quite unable to help it.

POST-DIPHTHERITIC PARALYSIS

As its name implies, this form of paralysis follows upon an attack of diphtheria, but it is not at all uncommon for the symptoms of paralysis to be the first intimation that the child has been suffering from diphtheria, for a very mild and unrecognised attack of that disease may yet be followed by paralysis, especially if the patient has not been sufficiently ill with the throat trouble to be kept in bed.

Symptoms.—The first symptom is usually difficulty in swallowing, especially in swallowing liquids, owing to paralysis of the muscles of the throat. When drinking the child chokes and some of the fluid comes back ("regurgitates") through the nose. The next symptom is a nasal twang, then the eyes squint more or less severely, and the legs drag when the child tries to walk. If the attack be a mild one, matters may progress no further, but if the paralysis increases, the child becomes unable to swallow at all, and cannot move its limbs or turn in bed, while the breathing becomes shallow and laboured, owing to the diaphragm becoming paralysed, while paralysis of the heart too often leads to a fatal issue.

Nursing points.—Much depends upon the nursing of these cases. Care may cut short the progress of the disease, but if it does not, or the more serious symptoms above mentioned are already present, it is principally with the nurse that the hope of recovery rests. The patient must be kept absolutely quiet in bed, sitting up, if possible, must be forbidden, and as little movement as possible allowed. With a mild case, the arm straps already mentioned must be used until the child is accustomed and reconciled to lying down (p. 215), and in some instances, when dealing with a very refractory will, may be needed throughout the attack. The usual attention must, of course, be paid to the prevention of bed-sores by proper treatment of the back, shoulders, heels, etc.

The feeding of these patients is very important and very difficult. Fluids being less easily grasped by the paralysed muscles of the glottis than solids, it often happens that a few drops enter the trachea and may set up septic pneumonia. All food administered by the mouth has therefore to be thickened and given by the nurse very slowly with a teaspoon. Milk or cocoa may be thickened with cornflour or arrowroot, while custard

pudding, rice or sago when made stiff, and jelly are all suitable. When medicine has to be given by the mouth, the best way is to melt a little jelly, add the prescribed dose to it, and then put the mixture in a cold place or on ice until the jelly solidifies again, each dose being, of course, prepared some hours before it is due, in order to give the jelly time to set. In very bad cases, feeding by the mouth has to be given up, and the nasal tube or rectal injections must be resorted to. The nasal feeding requires more care than ever, for, owing to the absence of feeling in the paralysed parts, the slipping of the catheter into the trachea may not even excite a cough, and if the child is alarmed or angered by the proceeding, a fatal attack of syncope may come on. Gentleness and tact will, however, probably avert opposition on the part of the patient, and the disappearance of a sufficient length of tube to reach below the sternum is a guarantee that it must be in the œsophagus.

Feeding by mouth or nose ceases to be possible when there is vomiting, which is caused by paralysis of the gastric nerve, and is a serious danger in itself, as the matter ejected from the stomach is liable to be drawn into the trachea owing to the paralysis of the epiglottis, and to set up septic pneumonia, if not to cause death at once. The nurse must be always on the look-out for vomiting, and be ready to turn her patient on the side, and remove all vomited food from the mouth at once; but where it does occur, rectal feeding will probably have to be employed, though it is not a satisfactory method with children, as the bowel is apt after a time to become irritable and to expel the enemata or suppositories at once. If, however, the bowel be washed out once daily with a soap-and-water enema, the retention of the nutrients will be helped, and these must be given very slowly and carefully.

When rectal feeding is ordered, as well as when solid or semi-solid food only is allowed, the patient often suffers much from thirst, and as water cannot be swallowed, this may be alleviated by giving (with the doctor's permission) an enema of eight or ten ounces of very warm water to be retained. Drugs are usually administered in these circumstances by hypodermic injections, and as they are generally either atropine or strychnine, alone or combined, and, being designed to stimulate the weakened action of the heart, are given in rather heroic doses, the nurse must make herself acquainted with the symptoms of atropine and strychnine poisoning, and be ready to report if the atropine gives rise to excessive flushing and dryness of the skin, great restlessness, suppression of

urine, and delirium, or if the strychnine causes twitching of the facial muscles and convulsive movements of the limbs.

Above all, the nurse must never forget the possibility of sudden syncope with every case of this disease. All excitement, argument, struggling or sudden movement must be avoided; the child must never be left alone, and great caution must be observed during convalescence. Sitting up in bed, getting up, walking about, must each be accomplished by a series of gradual movements, while the condition of the pulse is carefully noted. No cases require more care than do those of post-diphtheritic paralysis, and in none is the nurse more amply rewarded when she sees her patient fully restored to health, and able to run about and play again.

MENINGITIS

Inflammation of the meninges, or membranes covering the brain, is a very frequent and terribly fatal disease amongst children. It occurs at all ages, and is most often due to tubercular disease.

Symptoms.—Amongst infants and very young children symptoms of headache are not very easily discovered, but the action of pressing the hands to the head, or turning it restlessly from side to side against the pillow, is very suggestive. Sudden vomiting in combination with headache generally betokens meningitis, and beginning thus, the disease progresses until the child refuses all food, becomes dull and cannot be roused, while the eyes begin to squint. As the child becomes worse, he grows more or less unconscious of his surroundings, the muscles of the head and neck contract until the head is drawn back, and in many instances the whole back contracts until the patient lies with only the back of his head and his heels touching the bed, while the whole body is drawn into a rigid arch between these two points; the eyes are fixed open, and he gives vent to those piercing screams which are so typical of the disease.

Nursing points.—These cases usually terminate fatally, and the nurse can only do her best to make her patient as comfortable as possible until he dies either in convulsions or more gradually from exhaustion. When swallowing has become impossible, either nasal feeding or nutrient enemata must be resorted to, but the latter method is often impracticable, as owing to the comatose condition, involving incontinence of urine and fæces, the enemata are not retained, while where there is much vomiting, feeding with the nasal tube is very difficult. Constant attention must

be paid to the evacuations, and the quantity of urine passed must be noted, as these cases sometimes have retention, resulting in distension of the bladder. Great care has to be taken to prevent bed-sores on those parts which touch the bed, especially the back of the head. The eyes also need attention, for as the lids do not close, dust collects upon the eye-balls and must be removed by bathing, while the mouth, which is often also open, wants washing out. When vomiting occurs, care must be taken that none of the matter vomited gets into the trachea, the head being turned to one side and the mouth cleaned out.

VI.—MISCELLANEOUS DISEASES AND DEFORMITIES

RICKETS

Of all infantile diseases rickets is probably the most common and the most easily preventible. In former days, want of fresh air, damp dwellings or even inherited disease were considered to be the main causes of rickets; now, though such conditions doubtless give rise to a general debility which makes a child liable to contract any disease, rickets is held to be originated by errors of feeding, too much carbohydrate or starch, and especially too little fat, being considered responsible for this affection. It is in accordance with this view that symptoms of rickets do not appear till after the first six months of life are past, and that it occurs most often amongst artificially fed children. Babies brought up on patent foods are very likely to suffer from this disease, as such foods are deficient in fat as compared with mother's milk, and many of them contain a large percentage of starch. Children who are breast-fed, however, may also get rickets, either because the mother continues to suckle them too long (when her milk is no longer sufficiently nutritious), until they are perhaps two years old or more, or because as soon as weaned they are fed upon "what we have ourselves," and instead of getting a good supply of milk, live principally upon bread, potatoes, pastry and tea.

Symptoms.—The first signs to attract attention are the late appearance of the teeth, and the slowness of the fontanelles in closing. Other symptoms in the early stages of the disease are diarrhoea, with undigested clay-like stools, restlessness during sleep, and much sweating about the head and neck, especially at night. Later, the condition of the bones attracts attention. The wrist and ankle joints are observed to be enlarged, knobs (known as "beads") appear on the ends of the ribs, and the long bones become bent. The child with rickets who has already learnt to

walk, develops "bandy-legs" as the bones curve outwards owing to the weight upon them, or is "knock-kneed," or the bones are bent forwards in a curve from knee to ankle. If the child is not yet able to walk, but is crawling about, the arm bones also may become bent, or if the child does not even attempt to crawl, but sits on the floor, with its legs curled up, the leg bones will become shaped by the customary attitude.

Nursing points.—As a rule the sufferer from rickets comes to hospital for treatment for some disease the result of the primary disorder, rather than for rickets itself, which is treated mostly by the substitution of a proper diet, consisting mainly of milk, eggs, cream, or cod-liver oil, and raw meat juice, discarding all starchy foods, such as bread, potatoes, etc. Such secondary complaints are tetany, croup, and possibly infantile scurvy.

TETANY

This is a very painful disease, which comes on in sudden spasms, causing the fingers and toes to be contracted and drawn together, while the paroxysm lasts, and making the patient scream with pain if touched.

Nursing points.—Excitement or alarm tends to bring on the spasms, so that the child must be very gently dealt with. The limbs should be kept warm with woollen gloves and stockings, and all touching of the child avoided during the spasm. In bad cases, sedatives will be ordered, but the treatment consists mainly in dieting as above described for the curing of the rickets which causes the tetany.

LARYNGISMUS STRIDULUS, OR CROUP

This also is a spasmodic attack, which affects the breathing. It comes on quite suddenly, most often at night, when the child starts up, draws in its breath with a long whistling "crow," and then turns blue or even black in the face, and stops breathing. Alarming as these attacks are, they very rarely end fatally, though instances are not unknown in which delicate children have failed to recover their breath owing to heart failure. As a rule, the spasm of the glottis relaxes and the breathing starts again as usual.

Nursing points.—If ice is at hand it should be placed at the back of the neck, but more easily obtainable and probably equally efficacious is a sponge wrung out in hot water and held to the front of the throat.

Often, however, the attack is over before any remedial measures can be taken, and the child lies back in bed in a state of exhaustion and dripping with perspiration.

INFANTILE SCURVY

Opinions are divided as to whether this disease results from rickets (it used to be called scurvy rickets), but in any case it is known to be caused by improper diet, as is rickets.

Symptoms.—The limbs, especially the legs, are very tender to the touch, and may be covered with small swellings; the mouth or gums are tender and prone to bleed, and blood may be passed in the stools and urine.

Nursing points.—Owing to the tenderness present, the child must be handled as little as possible. It should lie on a water pillow, with a cradle to keep the bed-clothes from pressing on the limbs, which should be warmly clothed. The mouth must be gently sponged out with boracic lotion, or glycerine and lemon juice. As the disease appears to be due to a lack of *freshness* in the diet (most of the cases occurring amongst children brought up on preserved patent foods to which fresh milk is not added, or even upon *sterilised* milk), such articles as unboiled milk, lemon, orange, or grape juice, are usually ordered, when the condition soon improves.

Deformities often result from rickets, owing to the bending of the softened bones, and need special treatment, which is described in the chapter on Orthopædic Nursing (p. 249).

DISEASE OF THE HIP-JOINT

This condition, usually of tubercular origin, is so sadly frequent amongst our youthful population that it may be termed a children's disease. Where operation is required the dressing of the wounds does not differ from that required in similar cases, but often the patient lies for weeks or months or even years needing constant attention.

Symptoms.—Lameness, pain in the hip, or frequently pain ascribed to the thigh or knee, are suggestive of *morbis coxæ*.

Nursing points.—As a rule in the early stages of hip-joint disease, extension is the method employed. A bed made up with a fracture-board so that it is firm and hard below the mattress is necessary. On this the patient lies flat on his back, and the extension apparatus is applied to the affected leg. This consists of two long strips of strapping joined

in the middle over a small flat piece of wood, in which is a small hole. The leg having been bandaged to above the knee with a flannel or domette bandage, the strapping is warmed and applied, one strip on the outside and one on the inside of the leg, from half-way up the thigh to the ankle, and, secured by having narrow strips of strapping passed over it and round the leg at intervals, the piece of wood hangs in a loop of strapping below the foot, and a piece of cord is passed through the hole. A cotton bandage is now applied all up the leg over the strapping to keep all neat and clean, and as soon as the strapping is quite dry and firm, the loose end of the piece of cord is passed through a pulley fixed at the bottom of the bed and the weight ordered by the doctor hung to the cord; a tin full of shot of the prescribed weight being a simple form of appliance. Shoulder straps must be employed to prevent the child from slipping down in bed, and a pillow placed under the knee to keep the leg in position. Often a long Liston's splint is attached to the *sound* leg so as to keep the patient quiet. As the object of the extension is to keep the limb stretched, the weight must never be omitted except by medical orders, save when the bed-pan has to be given, or the child lifted or moved. Then the weight must be taken off and the nurse, standing on the sound side, must maintain traction on the diseased hip by holding the thigh in the right position, as she lifts the child, turns him on his side, or slips the slipper bed-pan into position.

A Thomas' splint is generally used for a hip case when the limb is already brought into better position by means of the extension, and when wearing this, the child is allowed to get up and walk about on crutches, the sound leg being shod with a high patten, so that the diseased limb hangs high above the ground as the child moves on his crutches, while it is kept immovable by the splint. In some instances, a double Thomas' splint is used, both legs being thus kept still, though then, of course, the patient is restricted to lying down. Such a splint is the least tiresome method to the nurse, as the child cannot move and is much easier to lift, in spite of the extra weight of the iron splint, there being no fear of injuring the limb in any way while it is thus fixed.

The prevention of bed-sores and splint-sores occupies the nurse's attention in all these forms of treatment, and all the more as such children are usually kept so long in bed or wearing some apparatus.

The other diseases from which children suffer do not materially differ

in symptoms or in nursing from those in adults, and the reader is therefore referred to the various sections under which they severally occur.

CLEFT PALATE AND HARE-LIP

These two conditions are the result of imperfect development of the child before birth, so that it enters upon life with the upper lip or the mouth not properly formed. The two deformities often exist together, but either may be present alone. The deformity of *hare-lip* (so called from its resemblance to the cloven lip of the hare) is quite obvious. It varies from a small notch in the upper lip to a division extending up to the nostril, and may be double, that is to say, divided on both sides of the nose. *Cleft palate* may escape observation at birth, and attention only be drawn to the condition when it is found the child cannot suck or that the milk returns down the nose, but when the mouth is examined a hole of greater or less extent will be seen in the roof.

Nursing points.—Before operation the feeding of these infants requires much care, unless the deformity is very slight. Sucking the breast or bottle-teat is impossible, and whether the food consists of the mother's milk drawn off with a breast pump, or of an artificial food, it must be given with a small tea-spoon in minute quantities at a time, or dropped from a glass dropper. It is a slow and tedious process and requires much patience on the part of the nurse.

Operation for hare-lip is usually done at a very early age, when the baby is but six or eight weeks old in some instances, and the child should be in hospital some days before the operation, so that it may be accustomed to its nurses and their methods of feeding. The operation consists in joining the edges of the cleft in the lip together by means of stitches, the two sides being afterwards drawn together by means of gauze and collodion, or small strips of strapping, so as to take all strain off the stitches. The nurse's great object now is to prevent the edges of the wound from breaking away from the stitches, which will necessitate the operation being performed again. The baby must not be allowed to cry, and the usual rule of never taking a patient out of bed and carrying it about has often to be broken in these cases, for at all costs crying must be prevented or the lip will separate. When the child is fed, it must not be allowed to suck at the spoon, but the cheeks must be held together so as to open the mouth without straining the lip, and the food dropped slowly in ; care being taken not to soil the dressing on the lip.

The baby's hands must also be so fastened that it cannot touch its mouth. Even after the removal of the stitches the same care must be taken for a time until the lip is quite soundly healed.

The **operation for cleft palate** used to be performed at a much later age, but it is now usually done before the teeth appear, and at all events before the child is two years old. It is a far more difficult operation than that for hare-lip. The joining of the edges of the palate is often a very troublesome matter, and more than one operation is frequently necessary, even when there is no breaking away of the edges after they have been sutured. In some cases no operation is of avail, and the children grow up speaking so indistinctly as to be almost unintelligible, though sometimes the insertion of a silver plate into the roof of the mouth in adult life produces normal speech and pronunciation.

After the operation for cleft palate the children require the greatest care; no crying (or talking in older patients) must be allowed, and every want must be anticipated. Many surgeons order the patient to be fed by nutrient enemata for the first few days, but sometimes feeding by the mouth is preferred, and a dropper or a syringe with a piece of tubing on the end may be employed to drop the milk on the back of the tongue. Syringing or spraying out the mouth with water or a lotion is often ordered, and must be most gently and carefully performed, so that the mouth is cleansed without any damage being done to the wound. The nurse may well be proud if none of the inserted stitches break down.

SPINA BIFIDA

This is another deformity resulting from imperfect development before birth. In these cases there is a gap in the vertebræ, resulting in the projection of the spinal cord through the opening, in the form of a round soft tumour covered with a thin skin. As a rule these children only survive their birth for a short time.

Nursing points.—In mild cases an operation is performed and the tumour is removed, or drained. The nurse must in any case protect the tumour by enveloping it in pads of wool, while keeping the baby lying on its side, as the danger is that the skin will ulcerate, and the fluid inside the tumour escape, resulting in death. After operation, the wound is dressed in the ordinary way, and the child kept lying on its side with the buttocks raised on a pillow. As already stated, however, most of these patients soon die.

IMPERFORATE ANUS

This is another condition in which there is improper development, here resulting in there being no opening for the bowel. The defect, of course, needs immediate treatment, as the child is unable to pass the contents of the intestine, and according to the extent of the deformity the operation may simply be to form an anus at the lower end of the rectum, or to perform colotomy. In either case the nurse's duties are similar to those required after other operations of the same kind, but owing to the tender age of the patient, generally under twenty-four hours old, the child too often succumbs to the shock.

PHIMOSIS

This is a somewhat common condition amongst boys, and generally necessitates the operation of circumcision, and as this operation is better performed in early childhood, nurses should recommend mothers to seek medical advice at once, if the condition seems to exist.

Symptoms.—The foreskin being too long or narrow, or the orifice being too small, there may be difficulty in the passing of urine, or it may be constantly dribbling away. Irritation of the parts may also occur, and the child falls into the habit of fingering the penis. Incontinence of urine and masturbation are both conditions for which medical advice should be sought without delay, and circumcision is frequently performed in consequence.

Nursing points.—The operation is a slight one, and usually performed in the out-patient department. A dressing of gauze and collodion is generally applied, and the mother is instructed to bathe this off at the end of twenty-four or forty-eight hours, and apply a strip of rag or butter-muslin spread with boric ointment, this to be changed every time the child passes urine. The surgeon will appoint the time at which the patient is to return to have the stitches taken out.

ENLARGED TONSILS AND ADENOID GROWTHS

At the present day these two conditions exist to such a great extent and attract so much attention that some mention must be made of them here.

Symptoms.—The two conditions often exist together, and even when only one exists at a time, the child presents much the same

aspect. The back of the nose is blocked where there should be a passage for the air from the pharynx, and consequently, being unable to breathe through the nose, the child becomes a "mouth breather," and spends its time with gaping mouth, snoring loudly at night, often deaf and consequently considered dull of intellect, while it is always "catching colds" in its head or falling a victim to sore throat.

Nursing points.—After operation is over, hæmorrhage must be watched for, though it is not very common, although large quantities of blood may be vomited, having been previously swallowed. Very important is it that instructions should now be given in the art of breathing properly, for with the passages clear, the child can breathe through the nose with the mouth closed, but not having previously done so, it has to be made to practise this for a certain time once or twice daily until the habit is so formed that the mouth no longer falls open naturally. If this teaching is postponed the air-passages may be again obstructed, and a second operation prove necessary.

CHAPTER XXX

THE NURSING OF ORTHOPÆDIC CASES

BY MARY E. PINSENT

Congenital Talipes Equino-varus—Talipes Valgus—Paralytic Cases—Infantile Hemiplegia and Spastic Cases—Deformities of the Spine: Kyphosis, Lordosis, Scoliosis—Rachitic Cases—Congenital Dislocation of the Hips—Wry Neck—Hallux Valgus—Hammer Toe—Webbed Fingers—Contracted Fingers.

THE most literal meaning of the word *orthopædic* is that which has to do with a "straight child," and the practice of orthopædic surgery concerns itself first with the straightening of the crippled child, but is extended in its modern development to the cure of malformations in patients of any age. The work is thus of very varied nature, and not only covers the cure of club-foot, flat-foot, hammer toes, webbed fingers, and the like, but includes also all contractions of muscles or tendons, dislocations of the hip, spinal curvature, and other deformities following on paralysis or accident.

The success of orthopædic treatment rests to a very considerable extent, perhaps more than in any other branch of surgery, on skilful observation and minute attention to detail on the part of the nurse. The treatment is mainly operative, but largely depends, too, on mechanical appliances and physiological processes consequent on massage, electrical applications, douchings, exercises, and careful manipulation.

The special duties of the orthopædic nurse may best be explained by a description of the work which she must undertake, and the reasons for it, in the cases which most commonly occur in an orthopædic hospital.

First, it may be well to consider the most frequent of all orthopædic cases, *congenital talipes*, or **club-foot**, right, left, or both.

There are many varieties of club-foot. In *talipes varus* the whole foot is twisted inwards; in *talipes valgus* the foot is flattened, and twisted

outwards; in *talipes equinus* (so called from the resemblance to the configuration of a horse's foot) the heel is drawn up, so that the patient walks on his toes; in *talipes calcaneus* the heel is too long and the foot raised; in *talipes arcuatus* the arch of the foot is too pronounced.

Most commonly this deformity is a combination of the equinus and varus positions, the heel being drawn up, and the foot twisted inwards. It is known as **congenital talipes equino-varus**. In it there is every reason to hope for a complete cure; but it is commonly agreed, though the circumstances of each case should be specially considered, that treatment is most successfully applied to a patient between one and six months old.

In slight cases a cure is sometimes effected by manipulation alone. Great patience must be exercised and the foot massaged gently and manipulated in the right direction.

More stringent treatment is required in severe cases, subcutaneous tenotomy being necessary. This operation consists in the division of the contracted tendon, performed beneath the skin.

After the operation the feet are gradually straightened by manipulation and by the application of malleable iron splints, tin shoes being worn at night until the child is old enough to walk.

The treatment may usually be completed in about three months; but when, as is often the case, a patient is not brought to the hospital until after he has walked for several years on the deformed feet, the malformation is much more difficult to correct. The deformity has become greatly accentuated, and very often a large bursa has formed on the outer side of the foot. Such cases need a more severe and prolonged method of treatment.

A child of six or seven years of age is admitted to hospital with strongly marked talipes, both feet being turned completely in; the muscles and tendons are tightly contracted. It is necessary, therefore, for the surgeon to divide, under anæsthetic, the anterior and posterior tibials, subcutaneously, in both feet. After the operation the feet are bandaged to a flat, malleable iron splint, well padded (Plate LX., Fig. 1); but at this stage no attempt is made to straighten the foot.

After three days the bandages are removed and the wounds are usually by this time quite healed.

If this is the case, the splint is bent slightly outwards and placed on the outer side of the leg; the foot is bandaged tightly to it, being drawn



Photos: Pictorial Agency.

FIG. 1.—MALLEABLE IRON SPLINTS FOR TALIPES VARUS.



FIG. 2.—SPLINT APPLIED FOR KNOCK-KNEES.

towards the splint as far as is possible without giving pain to the patient. The process is repeated daily, the splint being bent a little further outwards each morning, and in this way the foot is gradually stretched and brought into a straight line with the leg. This stage of the treatment usually occupies several weeks. During that time the tendon is growing, and it will ultimately reunite in the new position. The varus has been corrected.

It should be noted that it may be necessary slightly to alter the relative position of splint and leg from time to time should the pressure induce any redness of the skin.

After the correction of the varus, the equinus claims attention. Another operation is necessary, the division of the tendo-Achillis. As before, the foot is usually bandaged for three days in the full equinus position, after which the bandage is removed and the Scarpa shoe applied (Plate LXII., Fig. 1). This consists simply of an iron sole plate with a heel piece going about two inches up the leg and a calf portion. It is lined with soft leather throughout, and has 2-, 3-, or 5-rack and pinion movements, lateral, uplifting, and rotatory. It may thus be applied, after suitable adjustment, to any case of talipes.

In the case under consideration the foot is strapped into the shoe and the uplifting movement applied, the foot-piece being screwed up as far as possible without discomfort to the patient.

The shoe is re-adjusted every morning, the foot at the same time being gently massaged and manipulated in accordance with the surgeon's instructions.

Great care must be exercised not to produce an uneven pressure. The centre of the strap over the instep is very apt to cause a sore, and the back of the heel is apt to become sore too, through pressure on the heel piece. A sore of this kind is regarded as seriously in orthopædic as is a bed-sore in general nursing; indeed, it is much more serious, for it necessarily involves a suspension of all active treatment, and may cause a relapse to the old position.

The whole treatment of varus and equinus usually occupies from three to seven months, though some cases require much longer treatment before the foot is brought to a normal position. In such cases, wrenching under an anæsthetic may be necessary.

The patient is discharged from the hospital in special surgical boots and instruments which keep the feet in the correct position. At night

a padded tin shoe is worn to serve the same purpose. The boots and night shoes are usually worn until the patient has stopped growing, though sometimes they may be discarded earlier.

The cases of congenital talipes equino-varus are not all so straightforward as those described, and an open operation will sometimes be found necessary. For example, all the contracted tendons may have to be simultaneously divided by what is known as Phelps' operation. This is not often performed, owing to the danger of subsequent relapse, which is greater in this than in the slower and more common treatment. As before, the foot is treated by means of a Scarpa shoe after the operation.

Where the feet have grown stiff and rigid and the bones have hardened in the deformed position, an operation for the removal of bone—tarsectomy or astragalectomy—may be necessary.

The deformity is thus corrected at once, and there is not much danger of relapse; but the disadvantage of the method is that, should the foot relapse, there is little hope of doing anything further for the patient.

The nursing after an operation for the removal of bone is the same as for an ordinary surgical case; but, since the power of movement of the foot is diminished, massage and gentle passive movements will often be ordered.

This treatment is comparatively short, occupying only from six to eight weeks, which may often be a great consideration to an adult patient.

It must be remembered, however, that when it can be applied the slower method of a separate tenotomy for each tendon, with gradual stretching, is the better treatment, inasmuch as it leaves the foot as elastic and as useful as a normal foot.

Talipes valgus often occurs in orthopædic practice. It is caused by the arch of the foot falling, and is frequently attended by acute pain and swelling. It may be due to rickets, feeble health, rheumatism, injury, prolonged strain, or occupation involving much standing.

Complete rest is an important factor in the cure of all these cases, and, combined with manipulation and exercises, will often in slight cases suffice. Talipes valgus due to rickets is usually treated with exercises and a support fixed in the boot.

This deformity is not uncommonly met with in the nurses themselves, owing to the many hours which they spend daily on their feet. The pain at first is often very severe, and though without treatment this

gradually subsides, at the same time the arch of the foot disappears altogether, and walking thereafter is always difficult and often ungainly.

The cases due to rheumatism are the most difficult. The pain is often very severe, and there is much swelling, the foot losing all shape. The treatment prescribed is usually hot-air baths, and occasional sitting with the feet immersed in hot salt. Satisfactory results are often obtained, but the process is always slow and troublesome.

The deformity is corrected in severe cases by tenotomy of the peroneus longus and brevis, and the subsequent treatment consists in bandaging the foot to a specially bent malleable iron splint, with occasional wrenchings under anæsthetic as may be required.

The splint, as usual, must be adjusted daily, and massage and manipulation employed. After six weeks or two months the patient is discharged in surgical boots with sole plates, and is taught to do toe-and-heel exercises night and morning.

Some surgeons employ the Lorenz method for both flat-foot and club-foot. After the division of the tendons the foot is wrenched and placed in plaster in the right position at once, the foot being held until the plaster has firmly set.

All the varieties of club-foot that have been mentioned may be treated by tenotomy, by the Scarpa shoe (specially adjusted for each case), by manipulation, and by surgical boots.

Paralytic cases.—Many of the orthopædic cases, such as club-foot, and other muscular contractions, are the direct result of paralysis, and it may be well to allude to the special features which such cases present, inasmuch as they comprise a very important part of orthopædic nursing.

Paralysis affects certain muscles and tendons of the body, rendering them powerless to perform their proper functions, at the same time causing other muscles and tendons to become relatively stronger and thus causing contraction.

Deformities resulting from paralysis need the greatest care of all in their correction, owing firstly to the fact that the limbs are often very badly nourished and sores very easily induced; and, secondly, to the fact that the tendons, having a comparatively small resisting power, are liable to be overstretched, when a worse deformity may ensue.

It is sometimes necessary for the surgeon to guard against this by substituting elongation of the tendons for the usual cutting of the tendon (tenotomy); or it is sometimes possible by transplantation of tendons,

thus applying extra stimulus to a weak tendon, to restore power to the paralysed limb, and so correct the deformity.

It often happens that the whole of the muscles affecting one or more joints are paralysed and are thus deprived of all power of movement of the affected limb. This may be partially corrected by an operation which fixes the joint and gives to the patient the use of the limb, though not with the natural freedom.

General surgical nursing is required after the operation, and this is usually followed by massage and gentle passive movements or exercises, but only as may be directed by the surgeon.

Infantile hemiplegia and *spastic cases of paralysis* are perhaps the most difficult cases to nurse. The patient's brain is often affected, and he is usually unable to feed himself. The feeding is always a slow and difficult process. The deformed limbs are blue and wasted, and are quite cold to the touch. Very often they are covered with bad chilblains, and no operative treatment can be commenced until these are cured. The wasted limbs are massaged daily, and electrical applications may be ordered.

The patient must be kept warm, by flannel garments, hot bottles, and lying between blankets. The limbs are usually very rigid. The patient often cannot sit or stand alone, the adductors of the hips, the hamstrings, and tendo-Achillis all being tightly contracted. They are all divided by the surgeon, either by open operation or by subcutaneous tenotomy.

The operation may be done in one or more stages, as the surgeon may consider best. When the wounds are completely healed, the hips should be abducted daily, the angle of abduction being gradually increased and the legs fastened to the sides of the bed, a little further apart each day. At the same time the knee is flexed and extended and the foot manipulated. The treatment of the foot is, of course, similar to that in cases of congenital talipes equinus. Extension also may be sometimes applied to these cases.

The treatment extends over several months, and is often productive of excellent results. The patient is discharged from the hospital in boots and instruments, having been taught to walk.

The exercises referred to in the above cases are frequently satisfactorily applied by means of the Zander apparatus. A special room is set apart in the Royal National Orthopædic Hospital as an orthopædic



Photo: Pictorial Agency.

PLATE LXI.—PATIENT PARTIALLY SUSPENDED IN FRAME FITTED INTO COT

gymnasium and massage room, and this contains all the Zander appliances. One or other of these may be used for exercising every muscle and joint, and they are especially useful for cases where it would be difficult, without a very large staff of nurses, to give the necessary massage or long-continued passive movements.

The nurses in charge of this department give also special exercises to cases of slight spinal curvature, flat-foot, and any other deformity where exercises may be considered beneficial.

Deformities of the spine.—These deformities form a large proportion of the cases commonly arising in Orthopædics. They are usually classed under three headings—*kyphosis*, or angular curvature; *lordosis*, or anterior curvature; and *scoliosis*, or lateral curvature. These cases may be caused by disease (caries, tuberculosis), accident, rickets, paralysis, heredity, rheumatism, etc.

The surgeon always makes careful examination into the condition of the patient, as the form of treatment required largely depends on the cause of the deformity. When there is disease, the deformity varies directly with the severity of the disease and with the number of vertebræ involved. If the patient has had early treatment, and his general health throughout has been good, the result may occasionally be complete bony ankylosis with little or no deformity. It is essential that cases of spinal curvature due to caries or tuberculosis should be treated with recumbency and placed in the most healthy surroundings. Fresh air, sunshine, light nourishing food, with plenty of milk and fruit, form a large part of the curative treatment. It must be remembered that these patients are having no exercise, and will therefore require special food and laxative medicines.

In the Royal National Orthopædic Hospital these patients are nursed on the balconies. They must be kept warm with hot bottles, which should be changed frequently during the night, and with flannel jackets, woollen gloves, and plenty of blankets in cold weather. For some cases a special wooden frame with a combined bed-rest is fitted into the cot (Plate LXI.). The child is first made to sit up, and then, by means of straps under the arms and chin, he is partially suspended and all pressure is removed from the spine. Care must be taken to prevent soreness on the heels, which have to bear a greater pressure than is natural.

The straps are usually removed at night and the patient made to lie flat. The seat of the disease determines whether the patient is to

be suspended in a sitting position, and it will sometimes be necessary to keep him flat on his back on a firm horsehair mattress, extension being applied to the head and legs.

A water-bed may have to be used, if the treatment is likely to continue for many months, to prevent bed-sores, which very readily arise, especially in cases complicated by paralysis.

Some surgeons order these patients to lie in the supine position for some hours daily to relieve the pressure. Little children may have to be strapped to prevent their sitting up, and this is easily arranged by tying a wide piece of webbing, with circlets for the arms, across the chest and fixing the ends to the sides of the bed.

It frequently happens in these cases due to disease that there is complete paralysis of the lower limbs, and in such cases the improvement following on the treatment described is often very marked, all pain disappearing and movement slowly returning. Very soon the surgeon orders some exercise for the patient, and from that time he gradually begins to walk, a little more each day, great care being always taken to prevent over-fatigue. After about nine or twelve months from the commencement of the treatment he may be discharged from the hospital with a spinal support.

This support will prevent future increase of the deformity and support the weakness of the bone and muscles. The patient must now make frequent visits to the out-patient department, in order that the surgeon may watch the progress of the case and prescribe various exercises as they become suitable.

Little difficulty arises in a straightforward case, but unfortunately the spinal deformity is often accompanied by abscesses in the cervical, dorsal, lumbar, or sacral regions. These may clear up during the rest treatment, but are often too deep-seated for this and must be operated upon. In that event the most careful attention must be paid to all details of antisepsis, and the nurse may be required to irrigate and dress the wound daily.

As soon as the acute stage is passed, it is very desirable that the patient be transferred to a convalescent home, as good bracing air is a most important factor in the ultimate cure of these cases.

It is occasionally necessary in spinal deformities, the result of accident or disease, to perform an operation known as laminectomy, which consists in the removal of the diseased bones of the spine. The nursing

is the same as for a fractured spine, but the operation is not frequently performed, and never if there is hope of cure by any other means.

In cases of spinal deformity not due to disease or accident the success of the treatment is often decided by the stage at which the deformity has arrived when treatment is commenced.

If a patient applies for treatment at the very onset of the deformity, there is every prospect of great improvement, if not always of complete cure. The treatment is directed not only to the correction of the present deformity, but also to the prevention of its increase or of its recurrence in future.

The patient is ordered complete rest, lying flat on his back on a hard mattress with no pillow for several hours daily. Special exercises, in the gymnasium and on the Zander apparatus, massage and manual manipulation must be given as ordered by the surgeon. These are very slight in the beginning, and may be gradually increased as the patient's strength improves; in no case must they be continued if the patient complains of fatigue.

Rachitic cases.—These cases constitute a large class of the deformities met with in orthopædic hospitals. The most common of rachitic cases are *bow-legs* and *knock-knees*.

Bow-legs.—If the treatment is applied in the early stages before the bones become hard and set in the unnatural position, this deformity may be corrected by fixing a wide, straight, well-padded wooden splint to the inner side of the leg, stretching from just about the knee down to the heel. (Plate LXII., Fig. 2.)

The splints must be worn night and day, and are fastened with wide webbing straps and buckles as tightly as the child can bear them. During the treatment the patient must be kept almost entirely off his feet.

The straps must be gradually tightened each morning, as the bones become straighter, and massage and passive movements applied. The nurse should notice each day as she adjusts the straps that the ankles and knees are not subjected to too great a pressure, and if necessary the skin may be hardened by rubbing with spirit or protected by pads of wool.

The correction of **knock-knees** is similar, the splint here being fixed on the outside of the leg, stretching from the hip to the heel (Plate LX., Fig. 2). Or sometimes a special "trough" splint may be used, in which

case it is essential that the patient be kept entirely off his feet. This splint is removed daily so that the leg may be massaged and the passive movements applied.

Soft pads may be needed to relieve pressure due to any prominence, and thick white felt will be found very useful for this purpose. The splint may be screwed a little straighter each day.

When the legs have become straight the patient is allowed to walk in suitable boots and instruments.

If, however, the rickets have advanced to the hard stage before treatment, operation is necessary, and the nursing required is the same as for a simple fracture. In all cases of rickets careful feeding is, of course, essential, such as meat juice, cream, eggs, and plenty of milk.

Congenital dislocation of the hips.—During recent years the successful results obtained by treatment of cases of congenital dislocation of the hips have rendered these cases amongst the most interesting with which an orthopædic hospital is called upon to deal.

The deformity is caused in more ways than one. It frequently results from the slipping of the head of the femur out of the socket, perhaps in consequence of hereditary malformation of the acetabulum or of the head of the femur itself.

Often strong adhesions are formed round the joint, thus complicating the case, and these are broken down, under anæsthetic, before the femur is put into proper position. When this has been done the surgeon applies plaster-of-Paris all round the hip and waist and leg to just above the knee, with the knee flexed in a line with the hip, to keep the femur in position.

Immediately after operation the patient is wrapped in hot blankets surrounded with hot bottles, which serve to counteract the shock, and at the same time help to dry the plaster. Great care must be taken to secure as much comfort as possible for the patient. A pillow may be placed under the hips, and the feet must be carefully watched to see that the circulation is not interfered with. Should the plaster be too tight, it must be removed and re-applied.

Swelling round the hips will frequently be noticed for a few days, but this gradually subsides. It is important for the nurse to prevent the plaster from getting wet, and jaconet may be usefully employed for this purpose, as it is easily tucked round the plaster.

If one hip only is affected, after about two weeks the patient is



Photos : Pictorial Agency.

PLATE LXII.

- FIG. 1.—SCARPA SHOE APPLIED AFTER DIVISION OF TENDO ACHILLIS.
FIG. 2.—SPLINT FOR BOW-LEGS.

encouraged to walk, with a patten fixed to the deformed leg, but if both hips are affected, he must be kept lying down.

In either case the patient may now be discharged, and is brought to the out-patient department every six months for a new plaster. The treatment is continued in this way for eighteen months or two years, the leg being gradually brought round to a normal position. Massage and exercises may be prescribed by the surgeon after the final removal of the plaster. In some cases, special instruments are ordered to be worn for some months at the end of the treatment.

Torticollis, or wry neck.—Congenital wry neck is caused by contraction of the muscles which support the head. It is treated by manipulation, mechanically or operatively.

Slight deformity in a child may be cured by flexion of the head to the opposite shoulder and daily massage of the contracted muscle. Sometimes a mechanical appliance will effect the desired result.

Subcutaneous or open tenotomy is necessary in the more serious cases, after which the patient must be kept flat for three or four days with the head in the deformed position supported by sandbags on either side. The head is then gradually drawn over to the opposite side by gentle manipulation to stretch the contracted muscles. It must be kept in position by means of a surgical collar, or, in slight cases, by a band of velvet or elastic tied round the forehead and back of the head. One end of the velvet is fastened firmly to the shoulder on the side opposite the deformity. Sometimes, however, the head may be placed in the right position immediately after the operation, in which case it is fixed in plaster-of-Paris for about ten days.

A simple apparatus must usually be worn and manipulation daily applied for some time.

Wry neck may also be caused by rheumatism, abscesses, or spasm. If due to *rheumatism* it may be cured by hot fomentations to relieve the pain, and the usual medical treatment. When caused by an *abscess* the deformity gradually subsides as soon as the abscess is removed.

Spasmodic wry neck frequently subsides after complete rest, hot applications being given if necessary to relieve pain, and a nerve tonic, and perhaps daily applications of electricity. This treatment is sometimes tried in the hope of avoiding an operation.

Hallux valgus, or bunions.—This deformity is often very painful,

and is frequently caused by rheumatism or by wearing ill-fitting boots, too short or too narrow, or with pointed toes.

The great toe is thus pushed against the other toes and a bursa forms on the base of the phalanx and on the head of the first metatarsal bone. If, as not unusually happens, this becomes inflamed and suppurates, it must be treated with hot boracic fomentations until the inflammation subsides.

When this has been done and there is no further suppuration, an operation is performed, and, after the wound is healed, the patient must wear a sandal with two slots to keep the toe in proper position. A narrow bandage is placed over it, threaded through the slots and tied underneath.

In slight cases the inflammation is reduced by cold or soothing lotions and the toe is then manipulated outwards night and morning. A stocking with a separate division for the great toe should afterwards be worn, and wide surgical boots.

Bunions are often accompanied by corns on the upper part of the foot, causing great pain.

Hammer toe.—This very painful deformity is caused by contraction of the flexor tendon or by contracted bands of fascia.

The necessary tendons are divided and sandals with slots for the deformed toe or toes are worn night and day. If the extensors of the foot are contracted, all the toes may be deformed, and the same treatment is required. Great care must be taken to avoid relapse, and manipulation must be applied daily.

Webbed fingers have to be divided by operation, and afterwards kept carefully separated by strips of gauze until completely healed.

Contracted fingers are usually caused by burns or other accident, rheumatism, or paralysis.

The tendons or fasciæ are divided, and the after-treatment by means of massage, manipulation, and exercises is very important. The results obtained are usually most satisfactory.



